

## **Historic, archived document**

Do not assume content reflects current scientific knowledge, policies, or practices.



2 Ht  
UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Research Administration  
7. u. s. Bureau of Plant Industry, Soils,  
and Agricultural Engineering,

78 H. T. & S. Office Report No. 264

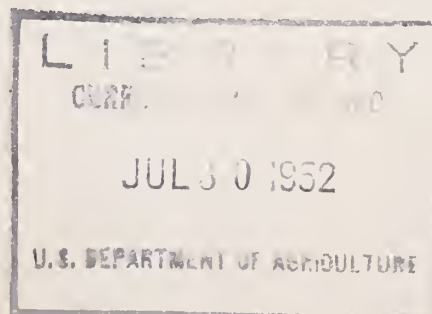
3 Refrigerator Car Heater Test with Bananas,  
New Orleans to Winnipeg, January 1952

By

W. H. Redit, Mechanical Engineer  
R. E. Hardenburg, Associate Horticulturist

7a Division of Handling, Transportation, and Storage of  
Horticultural Crops.

5a Beltsville, Maryland.  
May, 1952  
5c





REFRIGERATOR CAR HEATER TEST WITH BANANAS  
NEW ORLEANS TO WINNIPEG - JANUARY 1952

The critical temperature requirements of bananas place a heavy responsibility on the equipment used to maintain temperatures during transport. This is especially true of refrigerator car heaters employed for the protection of winter shipments of bananas. A series of tests were begun in 1950 to compare portable charcoal heaters, long used by the car lines for this purpose, with a built-in underslung charcoal heater of the type commonly used by the Canadian lines. The first year's test, made from New Orleans to Winnipeg in February was reported in H. T. & S. Office Report No. 226. Excellent results were obtained with both the underslung and portable charcoal heaters in fan cars. The following year, tests were made with the thermostatically controlled alcohol heater as well as the two types of charcoal heaters. In addition, the question of whether or not bunker drains should be left open in cars with portable heaters was investigated. Upon the basis of temperatures within the car, there was found no need to plug the drains, a common practice under heater service. However, the contention that the drains had to be left open to provide oxygen for the burning of the alcohol heaters was not verified by the tests for the oxygen levels were close to normal even though the drains were plugged. The underslung heater made a good showing but was not included in the drain test (H. T. & S. Office Report No. 241). A third test was made in January 1952 in which plugging of the drains was again investigated, this time including the underslung heater. This heater and the thermostatically controlled alcohol heater were compared. A report of this test is presented herewith.

Experimental Equipment and Procedure

Test cars - A total of 14 cars were used in the test to provide a comparison of underslung and alcohol heaters in cars with fans on and off and with drains open and closed. The performance of a thermostatically operated underslung heater and an experimental type overhead fan were afforded by two cars in the test.

The test cars are listed below together with type of heater and service operation:

Car No.	Fans	Type	HEATER	Operation	Drain Treatment
A IC 50242	ON	Underslung		Manual	plugged
B IC 50112	ON	Underslung		Manual	open
C IC 50055	OFF	Underslung		Manual	plugged
D IC 50192	OFF	Underslung		Manual	open
E IC 50462	ON	Alcohol		Thermostatic	plugged
F IC 50398	ON	Alcohol		Thermostatic	open
G IC 50477	OFF	Alcohol		Thermostatic	plugged
H IC 50451	OFF	Alcohol		Thermostatic	open
J BREX 74398	ON	Underslung		Thermostatic	plugged
K BREX 74399	ON (OVERHEAD)	Underslung		Manual	plugged
AA IC 50086	duplicate car A		CC IC 50357	duplicate car C	
BB IC 50225	duplicate car B		DD IC 50359	duplicate car D	



Cars AA, BB, CC, and DD were duplicates of A, B, C, and D, respectively, but it was not possible to unload them at Winnipeg as they were billed beyond. As unloading times and conditions were not comparable, only transit temperatures can be compared as far as Winnipeg. All of the IC 50000 series cars were fan cars in good condition, having been rebuilt within the past few years. Since all the cars equipped with the underslung heaters were fan cars, it was necessary to use them with the fans in the OFF position for those treatments calling for a non-fan car. All contained 3-3 1/2 inches of insulation, steel sheathing and floor racks 7 1/2 inches above the floor of the car. The two BREX cars were of recent construction and contained 4-4 1/2 inches of insulation, 7 1/2 inch floor racks, wall flues and were steel sheathed. Car K (BREX 74399) was equipped with the experimental Preco overhead belt driven fans. All cars were equipped with the conventional type bunker floor drains. The cars with underslung heaters contained Liquidometer thermometers for readings of air temperature at the ceiling and under the floor racks at the doorway center line positions. Drains were plugged by stuffing waste in the pipes.

Heaters - The Luminator-Mitchel underslung heater was permanently installed in the cars, with the firebox containing the heating coil attached under the floor near the doorway on one side of the car. A single pipe coil was placed on the car floor under the floor racks and extended around the car about 12 inches from the sides. The liquid in the system, a mixture of water and Prestone, was heated in the firebox coils and was circulated around the floor rack coil by convection. Midget charkets were burned in the heaters. Burning rate was controlled by a manually controlled damper with settings from 0 to 7. At zero setting, the damper is closed and the fire will be extinguished. In the thermostatically controlled system in Car J (BREX 74398) the circulation of heater fluid was controlled by a three-way thermostatically controlled valve which regulated the flow into the car floor coil. To prevent overheating in the firebox coil when this valve was closed to the car, the liquid was by-passed to a finned heat exchanger mounted under the car adjacent to the heater. The fire box capacity was 100 pounds of charkets although 60 pounds is considered a normal charge.

The alcohol heaters were of the latest type manufactured by Preco Inc. with a thermostatically controlled snuffer plate over the wick to control the burning rate. Temperature range was from 30° to 60° F. by 2 1/2° steps. A slot in the snuffer plate permitted a small portion of the wick to be exposed at all times, which provided a small flame to burn as a pilot when the thermostat had lowered the plate to the "off" position. Capacity of the heater was 5 gallons of fuel (methanol) which was sufficient to burn for approximately 48 hours. Further information on this heater may be found in a report of previous tests. 1/

---

1/ Car Heaters and Winter Protection of Fruit shipments - Summary of Transportation Tests with Apples from Washington State, December 1947, January and February, 1948.

Commodity and air temperatures - Six air and six fruit temperatures were obtained in each car by means of distant reading electrical resistance thermometers which were installed when the cars were assembled and serviced at New Orleans prior to loading. The positions in which the thermometers were placed and their designations are as follows:

<u>Position</u>	<u>Designation</u>
Fruit - Bottom bunker center line, head and rear	BBCL-H, BBCL-R
Top bunker center line, head and rear	TBCL-H, TBCL-R
Bottom doorway center line	BDCL
Top doorway center line	TDCL
Air-- Under ice grates, head and rear bunkers	Air bunker H, Air bunker R
Bottom bunker center line, head and rear	Air BBCL-H, Air BBCL-R
Top doorway center line (ceiling)	Air TDCL
Bottom doorway center line (under racks)	Air BDCL

Bottom layer fruit temperatures were obtained by inserting a resistance thermometer in a banana in the bottom hand of the bunch nearest the desired position, usually about 10" to 12" above the floor rack. In one-tier loads, the top position was in a top banana of the topmost hand, from 36" to 40" above the floor rack. In one and one-half tier loads the top position was in a banana on the top side of the horizontal bunch nearest the desired position in the car. The air temperatures at the bottom of the bunkers were taken under the ice grates at the center line of the car next to the bulkhead (separating bunker from loading space) about 3" above the drip pan. The BBCL air positions were in the loading space at the center line of the car 1" away from the bulkhead and approximately 1" above the floor rack. The top doorway air position was at the top liquidometer bulb (doorway, center line and 2" below the ceiling) while the bottom doorway air position was under the floor racks at the doorway center line. Because the train is wyed or reversed, during switching in Chicago the cars were wired at New Orleans so that the positions designated "Head" would be in the head or forward end of the car during the heating period beyond Chicago. The temperature data presented in the tables labeled "head" was actually to the rear of the car from New Orleans to Chicago but in proper position thereafter. This should be borne in mind in interpreting the temperatures during the ventilation period.

In order to secure a continuous record of air temperatures in the bunkers, Ryan recording thermometers were placed under the ice grates of the bunker in the head end of the cars near the resistance thermometer.



Fruit (pulp) temperatures were taken by Fruit Dispatch Company personnel at all regular inspection stations, using hand thermometers inserted in bananas near the top and bottom of bunches at the doorway in accordance with regular FDC inspection practice. Ventilators were manipulated and heaters operated on the basis of fruit temperature found by these inspections.

Test procedure - The electric resistance thermometers were placed in position in the fruit during the loading operation. The first temperature reading was made a few hours after all cars were loaded and assembled. Thereafter, readings were made 2 to 3 times a day except for the 24 hour period after lighting the heaters when weather conditions permitted only one reading. In general, readings were taken at all terminal stops. The fruit was inspected and doorway pulp temperatures read at the regular inspection stations at Jackson, Miss., Memphis, Tenn., Fulton, Ky., Bluford, Ill., Chicago, E. Dubuque, Ill., St. Paul, Minn., and Winnipeg. Supplementary readings were made at Fargo, N. D. and Noyes, Minn.

The test cars were loaded during the morning of January 18, at New Orleans. The bananas, of the Golfito Variety in excellent green condition, were unloaded from the Steamship Aztec, voyage 2. Fruit temperatures in the hold were from 54° to 56° and age was 21 hours from harvest at ship loading in Panama and 170 hours at unloading in New Orleans. Two sizes of bunches were loaded, 6 cars with medium nines and eight car with light nines. Net load weight varied from 20,665 pounds to 22,785 pounds with the average stem weight varying from 73.0 pounds to 95.6 pounds. The medium nines were stowed one tier standing while the light nines were stowed one tier standing and one tier flat on top. The stems in the bottom tier were placed in alternate rows across the car. The top flat tiers were placed horizontally at each end of the car, two stems across (one on each side of center line) with five to seven rows in each end. Similar sizes and stowage was used in comparable cars. This type of loading is called "one and one-half tier" and the number of horizontal stems in the top layer in each end is referred to as 8 x 8 flat or 7 x 7 flat according to the number so placed. Two "key" bunches, in a waxed kraft paper bag, were placed crosswise of all loads at the doorway. These were to take up the endwise slack in the load and acting as wedges worked down to the floor at destination. The complete loading data is contained in table 1.

The test cars were assembled after loading at the Sty Dock yards (New Orleans) of the Illinois Central Railroad. The first temperature reading was taken about 4 p.m. after which the alcohol heaters were fueled and installed. As the cars were fairly warm when loaded (68°-70° F. empty) and outside temperatures reached a maximum of 76° during the day, the fruit temperature in the cars rose rapidly from that at loading. Before departure, both rear vents on the non-fan cars were placed on the irons (2" open) while one rear vent was so adjusted on the fan cars. Departure from New Orleans was at 8:55 p.m. the day of loading with routing via the IC, CB&Q, GN and Midland Railroads. The total elapsed time en route was 115 hours and 15 minutes of which 58 hours and 10 minutes (50.4%) was running time. This low percentage was due to poor running caused by blizzard conditions after leaving St. Paul. As noted previously, the cars were reversed at Chicago when the



train was wye'd. The test cars arrived at St. James Yard, Winnipeg at 4 p.m., January 23, and were switched during the night for unloading next morning. During this time there was little fan action. Only 9 cars were unloaded at Winnipeg, the balance going beyond; three to Saskatoon and two to Edmonton. The test was terminated on these five cars after the reading at St. James Yard.

As previously stated, the rear vents were opened on the irons at New Orleans, one for fan cars and both for non-fan cars. Both rear vents were placed on the irons for the fan cars at Jackson, Miss., when temperatures remained high overnight. As outside temperatures during the first day were abnormally high, reaching a maximum of 70°, fruit temperatures continued to rise. However, after reaching Fulton at 8 p.m. the second night, reports were received of much cooler weather ahead so all vents were opened full in order to reduce fruit temperatures to a safe level. Upon reaching Reevesville at 2 a.m., a check of temperatures revealed a drop of 6° to 8°, therefore, the front vents were closed-plugs attached-and the rear vents left full open to the next regular inspection station at Bluford. Here all vents were closed-plugs in-since most all of the fruit temperatures were below 60° and outside temperatures were close to freezing. The vents remained closed for the rest of the trip.

The alcohol heaters were fueled and installed at New Orleans. All of the underslung heaters were fueled with 40 lbs. of midget charkets at Fulton. All heaters were lit at E. Dubuque when outside temperatures dropped to 12° with colder weather forecasted ahead. Heaters were inspected at each regular stop and additional inspections were made at Fargo and Noyes due to delays. The underslung heaters were re-fueled in St. Paul and Grand Forks while the alcohol heaters were re-fueled at Grand Forks. Some of the cars going beyond Winnipeg were re-fueled en route but no record of the amount added in transit or remaining at unloading was obtained.

All of the 9 Winnipeg cars were placed for unloading during the night following arrival and unloading began at 7 a.m. with the last car finished by 3:25 p.m. A final temperature reading was taken at 7 a.m. and final inspection of heaters was made shortly thereafter. Fuel remaining in the underslung heaters was estimated by examination of the fire box. Protection of the fruit from cold weather during unloading varied from a canvas tunnel covering a conveyor from car to warehouse, to no protection while unloading by hand into trucks. The fruit was inspected by members of the test party during unloading and the number of ripe and turning bunches were recorded. Although the test was terminated at Winnipeg for the five cars that went beyond, unloading data were obtained by Canadian Banana Company personnel and are included in table 1.

#### Weather Conditions

The weather at New Orleans was fairly warm for several days prior to loading with the result that the car temperatures were around 70° F. when loaded. Air temperatures reached 76° on loading day and 70° the next day

en route with a minimum of 62° during the intervening night. During the second day, temperatures dropped below freezing and remained between 10° and 20° the 3rd day. On the fourth day blizzard conditions were encountered with the temperature down to 20° below zero and with a minimum of 31° below on the 5th morning. Temperatures remained well below zero during unloading. Outside temperatures for the entire trip are shown in Fig. 1.

### Underslung Charcoal Heaters

In general, the underslung heaters did not maintain fruit temperatures above 56° F., as all cars lost temperature after the extremely cold weather was encountered (see figures 2 to 5 and 12 to 15). The reason for this reversal of performance from previous tests is not definitely known but three contributing factors may be considered. The open drains evidently contributed to it, but even in cars with closed drains temperatures dropped too low. This will be discussed later in the report. Another factor was the use of midget charkets in this test instead of the larger, regular sized briquets as used heretofore. There is some evidence that the small size fuel is somewhat slower burning, and the response to increasing the draft is not as rapid as for the larger size. The third factor has to do with the operation of the draft. None of the heaters were put on full draft position 7 until nearly 24 hours after the cold weather was encountered. It therefore appears that when midget charkets are used as fuel, some consideration should be given to setting the draft one or two positions further open than would be the normal practice under existing rules based on the use of standard size briquets, when car temperatures and anticipated colder weather indicate the need for more heat. Circumstance that may have had some bearing on the operation of the underslung heater was the blizzard condition during the day on January 22 when a great deal of snow was being blown about with some, no doubt, entering the heaters. Several long delays during this period during which the cars were standing or moving very slowly may have also been a factor as the burning rate of the heater is reduced somewhat while the car is standing, because the ashes are not shaken down as well as when the car is moving, and the draft is not as strong.

The draft setting varied between the cars during the test period, based on the pulp temperatures within the cars. The setting was on position 2 when all heaters were lit except two cars with higher fruit temperatures in which cases the draft was set at one. One of these heaters, car DD went out before reaching St. Paul and had to be re-lit. The draft was set at 4 in the thermostatically controlled heater car, J, which is the normal position for lighting this particular installation. As fruit temperatures dropped as cold weather was encountered, the drafts were opened until all were on 7 at unloading. The complete record of draft changes and heater servicing on these cars is found in tables 17 to 20 and 25 to 30. For the cars that went beyond Winnipeg, all fans were placed in the "ON" position, drains plugged and heater draft put in position 7 when such was not the case upon arrival in Winnipeg as these cars were expected to encounter very cold weather to destination and all subsequent servicing was to be done by regular railroad personnel under standard operating rules. In car J, the fruit temperatures continued to drop after cold weather was encountered, even after the thermostat was re-set from



55° to 60° at Grand Forks. Therefore at Noyes, the draft was advanced from 4 to 7 and one portable charcoal heater was placed in each bunker. Upon arrival at Winnipeg, the underslung heater was darkened by shutting off the draft and the two portables left burning until unloading. Although the underslung heater in this car appeared to be burning satisfactorily, the heat was evidently not getting into the car. Subsequent inspection of the car by car line personnel after its return to Chicago disclosed that the system was only half full of liquid due to an undetected leak in one of the hose connections to the heat exchanger.

Fuel consumption was generally less during this test made in severe winter weather than it was for this heater under more moderate conditions in previous tests. The fuel burned varied from 50 to 75 lbs. for the heating period with fan cars using somewhat more than non-fan cars. This lower-fuel consumption no doubt was an important factor in the lower car temperatures. Unfortunately, fuel records were not obtained on the duplicate cars which went beyond Winnipeg. The complete fuel record is found in tables 17 to 20 and 25 to 30.

### Alcohol Heaters

The operation of the alcohol heaters was generally satisfactory. Fruit temperatures in the 4 test cars with these heaters were several degrees above those in the other cars in the test; being slightly above the desired 56° to 60° F. range. Even with the thermostats set at 57 1/2°, top layer fruit temperatures rose above this point soon after the heaters were lit and stayed in the range of 60° to 63° until unloading. For this reason, the thermostat setting was changed to 55° at Fargo for cars E and F (fans on) and upon arrival at Winnipeg for car G (fans off). The bottom layer fruit temperatures in the two fan cars were well above 55° with no apparent effect in leaving the drains open. In fact, the temperatures in car F, drains open, were higher than in car E with the drains plugged. There was no evidence that plugging the drains affected the burning of the alcohol heaters in any way. Temperatures were more uniform in the fan cars, with a maximum spread of about 5° (figs. 6 and 7) which was somewhat greater than in the underslung heater cars. In the non-fan cars, this spread was much larger as shown in the curves in figs. 8 and 9. Bottom fruit temperatures in the non-fan cars were lower than in the fan cars and again showed no relationship to drain treatment, the lowest temperature in any of the alcohol heater cars being in car G with the drains plugged, and in which the bottom doorway fruit temperatures reached a minimum of 47°. Upon arrival at Winnipeg the bunker air temperatures of both cars G and H were about the same (around 32°) as shown in tables 9 and 10. After standing overnight, the temperatures in car G (drains plugged) had dropped while those in car H (drains open) had risen considerably.

None of the heaters burned continuously during the heating period as determined by inspection and fuel consumption. Some trouble was encountered in the burning of two of the heaters. The rear heater in car E was out at Noyes and again at Winnipeg while the head heater in car H was out at the

final inspection at unloading. In both cases, the wick was found to have a chemical deposit on the surface which interfered with the flame. Inspection of the other heaters showed a similar though less extensive deposit. This is believed to have been caused by the type of alcohol used in filling the heaters at New Orleans, which contained a purple coloring material. The heater manufacturer prescribes that only chemically pure, colorless methanol be used. Subsequent burning tests of these heaters have shown that this deposit was undoubtedly caused by the coloring material in the original fuel.

Fuel consumption per car for the heating period ranged from 7.2 gals. for car E to 9.2 gals. for car G. There appears to be a slight correlation between the amount of fuel used and the average load temperature in that the car with the highest temperature used the most fuel. Alcohol consumption by fan and non-fan cars was similar. Complete inspection and fuel data for the alcohol heaters are found in tables 21 to 24.

### Car Drain Treatment

As pointed out, the previous test on the effects of open vs. plugged drains did not include the underslung heater cars, therefore, a comparison was made of open and closed drains in underslung heater cars with fans on and fans off. A duplicate car of each treatment was included making a total of 8 underslung heater cars. In both the fan and non-fan cars average commodity temperatures in cars with the drains open were from 1° to 3° F. lower than in cars with drains plugged. It was also found that the temperature spread throughout the load generally was greater when the drains were left open, particularly in the non-fan cars (figs. 4, 5, 14 and 15). An exception to this was fan car B, fig. 3, in which there was a greater spread between the average top and bottom temperatures. The reason for this comparatively wide variation could not be determined. Three of the 4 cars with the drains open had minimum fruit temperatures below 50° upon arrival whereas all 4 cars with the drains plugged were above 50°. Air temperatures at positions along the bottom of the load and in the bunkers were generally from 1° to 4° lower in cars with drains open. An exception to this was car BB (fans on, drains open) in which both fruit and air temperatures were higher than for any of the underslung heater cars (fig. 13 and table 14). Fruit temperature at the bottom doorway position was nearly always higher than at the bunker positions which is the reverse of conditions in cars with portable heaters in the bunkers.

In cars with the alcohol heaters, there was no noticeable effect of drain treatment on either car temperatures or heater operation. This is in general agreement with the results obtained during the 1951 test.

### Comparison of Liquidometer and Pulp Temperatures

Pulp temperatures and Liquidometer readings taken at inspection points are shown in table 2. The top Liquidometer bulb was located at the ceiling while the top pulp temperature was taken in a banana from 36" to 40" above the floor rack. The bottom Liquidometer bulb was located under the floor racks and the bottom pulp temperature was taken in a banana 8" to 12" above



the floor rack. Therefore, the reason for the differences in temperatures between the pulp and Liquidometer readings, as shown in the table, is readily apparent. Because of this inconsistency, the Liquidometer readings can not be considered as a satisfactory substitute for banana pulp temperatures.

### Car Fans

The value of forced air circulation in maintaining more uniform commodity temperatures was again demonstrated, particularly when portable heaters placed in the bunkers are used. This is shown graphically when comparing the temperature curves for cars E and F (alcohol heaters, fans on) in figs. 6 and 7 with the same heaters in cars with the fans off (figs. 8 and 9). In the underslung heater cars there was not as great an effect due to the method of applying heat at the floor. With drains plugged, the average commodity temperature during the heating period was practically the same with or without fans. However, with drains open, the fan cars were from 2° to 3° warmer than the non-fan cars. The performance of the overhead fans in car K were the same as the regular floor type in the other fan cars. No trouble was experienced in the operation of any of the fans. It should be noted that the fan operation was not considered to be normal during the coldest part of the heating period due to the delays and slow movement of the train caused by the severe weather. During the ventilation period the operation of the fans also resulted in more uniform temperatures as may be seen from the temperature curves.

### Summary of Results

Although the heating period was shorter than may reasonably be expected for the January movement of bananas to Winnipeg from New Orleans, the temperature and weather conditions encountered beyond Minneapolis were considered severe. The underslung heaters in general did not maintain desired fruit temperatures after really cold weather was encountered, apparently due, in part, to slower burning fuel (midget charkets) and insufficient opening of the draft on the heaters. The thermostatically controlled underslung heater failed to maintain safe temperatures in the car due to a leak which resulted in loss of fluid in the coil. The alcohol heaters maintained temperatures at a slightly higher level than desired and required re-setting the thermostats to a lower point, 55°, in most of the cars. Coloring material in the alcohol appeared to cause a chemical deposit on the wicks which impaired the burning of some of the heaters. Leaving drains open resulted in somewhat lower fruit temperatures in the underslung heater cars, particularly in the non-fan cars. No practical difference was observed in the alcohol heater cars between open and plugged drains, either in temperatures or heater operation. The use of car fans gave more uniform temperatures during the heating period in all cars, but especially in the alcohol heater cars. The fans also provided more uniform temperatures in all cars when under ventilation. Liquidometer readings do not approximate doorway pulp temperatures.

Acknowledgements

The cooperation and assistance of the following individuals and companies whose efforts made this test possible are gratefully acknowledged.

Loads were furnished by the Fruit Dispatch Co., and general arrangements for the test were made by J. N. Kelley and G. C. Dexter of that organization and J. E. Ballard, Illinois Central Railroad.

The test cars and accommodations for the test party were furnished by the Illinois Central and Chicago, Burlington & Quincy Railroads. These lines and the Great Northern and the Midland Railroads handled the test train and equipment en route. The alcohol heaters were provided by the Illinois Central Railroad.

Ed Villani, Steve Arnold, Joseph Pizzuto, and Lester Galivan of the Fruit Dispatch Co. assisted in the preparation and loading of the test cars at New Orleans and Bruno Schesnel, Luminator-Mitchel Co. assisted in the preparation of the underslung heaters.

W. L. Pennman and W. R. Petsnick, Winnipeg, and B. W. Gillespie, Calgary, of the Canadian Banana Co. assisted in the unloading of the test cars and return of equipment.

The loading, unloading and conduct of the test en route was under the supervision of the test party whose members were:

G. C. Dexter, Fruit Dispatch Co.,	New Orleans - New Orleans to Winnipeg
K. W. Pepperdene	" " " " " " " "
J. R. Giegerich, Burlington Refrigerator Express Co.,	Chicago - New Orleans to Winnipeg
R. E. Hardenburg, U.S.D.A. Beltsville, Maryland -	New Orleans to Winnipeg
W. H. Redit,	" " " " " " " "
J. E. Ballard, Illinois Central R.R.,	Chicago - New Orleans to E. Dubuque
J. B. Sutherland	" " " " " " " Chicago
H. W. Anderson	" " " " " Fulton, Ky. to Chicago
H. B. Meinhardt,	Chicago, Burlington & Quincy R.R., Chicago - E. Dubuque to St. Paul
H. R. Hudgens, Jr.,	Chicago, Burlington & Quincy R.R., Chicago - E. Dubuque to Winnipeg
T. P. Guthrie, Fruit Dispatch Co.,	Minneapolis - Minneapolis to Winnipeg

Table No. 1

## LOADING AND UNLOADING DATA

Car Number	A-IC 50242	8-IC 50112	C-IC 50065	D-IC 50192	E-IC 50462	F-IC 50398	G-IC 50477	H-IC 50451	J-BREX 74398	F-BREX 74399	AA-IC 50086	BB-IC 50225	CC-IC 50357	DD-IC 50359
Consignee	Macdonalds Cons., Ltd.	Macdonalds Cons., Ltd.	Cran-Mowet Co.	Crescent Fruit Co.	Scott Fruit Co.	Sterling Fruit Co.	Universal Fruit Co., Ltd.	Western Growers Fruit Co., Ltd.	Rogers Fruit Co.	Shelley Bros.	Macdonalds Cons., Ltd.	Scott National Fruit Co.	Scott Fruit Co. Branch	Brown Fruit Branch
Destination	Winnipeg	Winnipeg	Winnipeg	Winnipeg	Winnipeg	Winnipeg	Winnipeg	Winnipeg	Winnipeg	Saskatoon	Saskatoon	Saskatoon	Edmonton	Edmonton
No. stems	283	278	241	242	273	273	233	234	282	275	274	268	245	236
Ave. wt. (lbs.)	73.0	74.5	89.6	92.7	78.7	77.4	95.0	93.8	76.8	76.5	78.8	81.7	93.0	95.6
Size	light nines	light nines	medium nines	medium nines	light nines	light nines	medium nines	medium nines	light nines	light nines	light nines	light nines	medium nines	medium nines
Net load wt.	20,665	20,705	21,585	22,425	21,485	21,125	22,125	21,945	21,645	21,025	21,585	21,885	22,785	22,565
Type of load	1 1/2 tier	1 1/2 tier	1 tier	1 tier	1 1/2 tier	1 1/2 tier	1 tier	1 tier	1 1/2 tier	1 1/2 tier	1 1/2 tier	1 1/2 tier	1 tier	1 tier
No. stems top layer	12 x 14	12 x 12	none	none	12 x 12	12 x 12	none	none	10 x 10	10 x 10	10 x 10	10 x 10	none	none
Loading - begun	8:55 AM	8:00 AM	8:45 AM	8:05 AM	8:00 AM	9:00 AM	8:00 AM	9:00 AM	11:05 AM	10:05 AM	9:10 AM	8:00 AM	8:45 AM	8:00 AM
(1/18/52) finished	10:05 AM	8:55 AM	9:30 AM	8:45 AM	9:05 AM	10:00 AM	9:00 AM	10:05 AM	12:05 PM	11:10 AM	10:05 AM	9:10 AM	10:05 AM	9:05 AM
Ave. fruit temp.	55°	55°	56.5°	56°	55°	55°	55°	55°	56°	57°	55°	55°	55°	55°
Ave. outside air temp.	67°	67°	67°	67°	67°	67°	67°	67°	68°	68°	67°	67°	67°	67°
Unloading - begun	10:45 AM	9:50 AM	7:15 AM	8:00 AM	8:00 AM	7:45 AM, 8:40 AM	2:15 PM	1:05 PM	7:15 AM	1/26 8:40 AM	1/25 4:00 PM	1/25 5:25 PM	1/26 9:45 AM	1/26 9:00 AM
(1/24/52) finished	11:30 AM	10:40 AM	7:45 AM	9:35 AM	8:45 AM	8:05 AM, 9:10 AM	3:25 PM	2:35 PM	7:50 AM	11:00 AM	4:55 PM	6:00 PM	--	--
Ave. fruit temp.	54.8°	51.7°	53.7°	48.6°	60.1°	63.0°	59.8°	56.9°	56.1°	53.3°	56.3°	56.2°	53.7°	55.5°
Ave. outside air temp.	-18°	-18°	-20°	-19°	-19°	-19°	-10°	-12°	-20°	-8°	-5°	-5°	-8°	-8°
No. turnings	26	14	32	13	29	150	45	58	16	76	75	138	61	59
No. ripes	1	1	1	0	17	63	37	37	0	21	24	44	--	--

Note: 1/ One-half car consigned to each receiver. Unloaded at same platform.

2/ Golfito variety - Panama produced - S. S. Aztec (2), January 18, 1952, New Orleans

3/ Average unloading temperature for Winnipeg cars (A to J) from last temperature reading with resistance thermometers at 7 AM, except Car G, 9:30 AM and Car H, 10:00 AM. Other cars temperature by hand thermometer during unloading.







Table No. 2

## Record of Doorway Pulp (fruit) Temperatures and Liquidometer Readings

Place	Outside air	Car A		Car B		Car C		Car D		Car E		Car F		Car G		Car H		Car J		Car K		Car AA		Car 88		Car C2		Car DD			
		Pulp T 8	Liquid-ometer T 8	Pulp T 8	Liquid-ometer T 8	Pulp T 8	Liquid-ometer T 8	Pulp T 8	Liquid-ometer T 8	Pulp T 8	Air. T 8	Pulp T 8	Air. T 8	Pulp T 8	Air. T 8	Pulp T 8	Air. T 8	Pulp T 8	Air. T 8	Pulp T 8	Liquid-ometer T 8	Pulp T 8	Air. T 8	Liquid-ometer T 8	Pulp T 8	Air. T 8	Liquid-ometer T 8	Pulp T 8	Air. T 8		
New Orleans	76°	61 58	63 60	63 69	67 62	62 59	64 60	60 61	58 67	61 62	59 63	58 63	61 62	59 64	59 62	62 58	63 61	63 58	66 60	62 59	64 60	61 59	68 63	62 59	67 61	61 59	64 60	63 60	-- 64		
Jackson	80°	62 61	61 60	63 61	65 64	61 59	63 61	61 61	60 66	62 61	62 61	62 61	62 61	62 60	63 60	62 60	63 63	63 62	61 62	60 62	61 62	60 62	61 66	64 62	61 64	62 60	64 60	63 61	-- 64		
Memphis	68°	63 62	64 63	66 66	62 61	67 61	62 61	66 62	63 63	64 62	63 63	64 62	63 63	64 62	63 62	63 62	65 64	64 62	64 61	64 63	63 61	63 62	67 66	64 63	65 64	63 62	64 61	63 62	-- 65		
Fulton	65°	63 63	65 64	64 63	67 66	63 62	67 62	62 63	62 66	64 64	63 64	63 63	64 63	64 63	63 61	63 63	65 65	64 65	63 64	64 63	62 64	64 68	66 64	63 66	65 64	64 64	65 61	64 63	-- 66		
Eluford	34°	56 56	60 60	57 57	60 58	57 62	55 58	57 62	55 58	57 62	58 58	57 58	57 58	57 58	58 57	58 57	58 56	57 57	57 57	57 57	56 55	55 58	61 61	58 57	60 60	59 58	58 54	59 59	-- 58		
Chicago	21°	58 57	58 61	58 58	60 58	57 60	55 57	57 61	56 58	58 59	59 59	57 57	57 58	58 57	56 57	53 57	58 58	57 57	57 57	57 56	56 57	57 60	60 58	58 59	59 59	58 57	59 54	58 58	-- 58		
E. Dubuque	12°	56 56	55 59	55 56	56 56	56 58	54 56	56 55	55 52	56 56	57 57	56 56	56 56	56 56	55 49	55 55	56 55	54 53	52 56	56 53	56 53	56 57	60 56	56 58	58 57	58 54	57 57	57 57	-- 54		
St. Paul	16°	56 57	56 58	55 56	56 55	55 56	53 55	55 55	55 53	58 58	60 61	59 59	60 57	58 54	66 49	58 56	64 53	55 56	53 53	55 55	54 54	58 58	62 56	56 56	58 57	56 53	55 54	55 54	-- 54		
Fargo	-19°	57 57	--	55 56	--	56 55	--	55 56	--	59 59	62 58	60 59	61 58	60 57	66 47	60 57	66 47	54 55	--	55 56	--	58 58	--	57 57	--	57 57	57 57	54 53	--	--	
Grand Forks	-25°	--	54 60	--	50 53	--	56 54	--	52 50	--	--	--	--	--	--	--	--	52 52	49 48	--	50 49	--	54 60	--	52 55	--	53 52	--	--	52	
Noyes	-15°	56 55	52 58	53 54	51 53	56 54	52 51	51 49	47 57	68 57	61 57	59 59	59 58	59 53	66 41	59 57	58 58	49 50	46 46	51 51	48 48	55 54	52 55	54 53	51 54	56 55	52 48	54 53	-- 51		
Winnipeg	-10°	--	53 59	--	51 53	--	54 53	--	50 48	--	57 57	59 59	59 58	59 54	60 41	60 56	62 58	53 52	59 47	--	47 47	54 55	52 58	--	52 55	--	52 50	--	--	51	
"	-20°	55 57	--	53 53	--	55 53	--	49 49	49 48	68 57	65 51	62 61	61 54	61 56	64 56	61 50	58 58	56 53	--	--	--	--	--	--	--	--	--	--	--	--	--

\* No liquidometer installed in these cars. Resistance thermometer top and bottom doorway air position readings used instead.

\*\* No reading taken

\*\*\* Top liquidometer out of adjustment



Table No. 3

CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. A - IC50242  
FANS "ON" - DRAINS PLUGGED - UNDERSLUNG HEATER

Station	Date	Time	OST	AIR		AIR		AIR		TBCL	TDCL	TBCL		BBCL	BDCL	BBCL	COMMODITY		
				Bunker	H	L	R	H	L			R	H				L	MAX	MIN
Jan.				H	L	R	H	L	R	H	L	R	H	L	R	H	L	R	
New Orleans	18			Loaded 8:55 - 10:05 AM															
"	18	4P	76°	590	590	580	590	635	585	615	605	620	590	550	575	62.0	55.0	61.3	57.2
"	18	5P	76°	One Rear Vent on Iron - open 2"															
Jackson	19	5A	60°	610	605	605	610	620	605	615	625	620	615	590	600	62.5	59.0	62.0	60.2
"	19	6A	60°	Both rear vents on irons - 2"															
Memphis	19	2P	68°	630	625	625	630	645	625	635	640	635	635	615	620	64.0	61.5	63.7	62.3
Fulton	19	8P	65°	640	635	635	640	645	635	645	650	645	645	625	630	65.0	62.5	64.7	63.3
"	19	9P	65°	All vents open full - 11"															
Reevesville	20	2A	42°	Front vents closed - plugs attached - rear vents full open															
Bluford	20	5:30A	34°	525	570	565	590	580	575	565	585	585	590	575	590	59.0	56.5	57.8	58.5
"	20	6A	34°	All vents closed - plugs in															
Chicago	20	5:30P	21°	570	560	575	590	580	585	585	590	590	590	575	585	59.0	57.5	58.8	58.3
E. Dubuque	21	8A	12°	545	540	560	570	555	570	565	575	570	580	565	570	58.0	56.5	57.0	57.2
"	21	9:30A	15°	Heater lighted															
St. Paul	21	6P	16°	575	570	575	585	570	570	570	575	580	580	560	570	58.0	56.0	57.5	57.0
Fargo	22	4P	-19°	500	530	535	565	560	560	560	570	585	570	555	575	58.5	55.5	57.2	56.7
Noyes	23	11:30A	-15°	525	500	520	540	525	530	535	535	545	545	525	540	54.5	52.5	53.8	53.7
Winnipeg	23	4:30P	-10°	525	530	545	565	545	550	555	555	565	565	545	560	56.5	54.5	55.8	55.7
"	24	7A	-20°	490	485	495	515	555	535	545	555	550	545	550	540	55.5	54.0	55.0	54.5
"	24			Unloaded 10:45 - 11:30 AM															

Note L/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago





CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. B IC50112  
FANS "ON" - DRAINS OPEN - UNDERSLUNG HEATER

Station	Date	Time	OST	AIR		AIR		AIR		AIR		TBCL		TBCL		TBCL		TBCL		COMMODITY						
				Bunker	H <sub>1</sub>	R <sub>1</sub>	H	BBCL	BDCL	TDCL	BDCL	BBCL	BDCL	BDCL	BDCL	BDCL	BDCL	BDCL	BDCL	BDCL	BDCL	BDCL	BDCL			
New Orleans	18																									
"	18	4P	76°	585	575	580	575	610	565	615	635	610	575	550	575	63.5	55.0	62.0	56.7							
"	18	5P	76°					One rear vent on iron - open 2"																		
Jackson	19	5A	60°	615	615	620	645	610	615	625		620	615	610	615	62.5	61.0	62.3	61.3							
"	19	6A	60°					Both rear vents on irons - open 2"																		
Memphis	19	2P	68°	625		630	630	630	620	635	635	630	625	625	635	63.5	62.5	63.3	62.5							
Fulton	19	8P	65°	640		640	640	635	635	645		640	635	635	635	64.5	63.5	64.3	63.5							
"	19	9P	65°					All vents open full - 11"																		
Reevesville	20	2A	42°					Front vents closed - plugs attached - rear vents full open																		
Bluford	20	5:30A	34°	510		560	580	565	575	565		590	575	580		59.0	56.5	57.8	57.8							
"	20	6A	34°					All vents closed - plugs in																		
Chicago	20	5:30P	21°	550		570	585	560	595	570		585	575	575	58.5	57.0	57.8	57.5								
E. Dubuque	21	8A	12°	500		530	550	530	565	565		555	545	560	56.5	54.5	56.0	55.3								
"	21	9:30A	15°					Heater lighted																		
St. Paul	21	6P	16°	505		525	565	540	535	565		560	540	555	56.5	54.0	56.3	54.8								
Fargo	22	4P	-19°	435		485	525	520	580	550	575	565	520	540	57.5	52.0	56.3	53.0								
Noyes	23	11:30A	-15°	435		460	530	510	570	520		525	485	520	52.5	48.5	52.3	50.3								
Winnipeg	23	4:30P	-10°	445		465	525	505	570	520	540	525	485	520	54.0	48.5	52.8	50.3								
"	24	7A	-20°	450		470	480	520	565	520	540	530	485	520	54.0	48.5	53.0	50.3								
"	24							Unloaded 9:50 - 10:40 AM																		

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars reversed from New Orleans to Chicago













CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. E - IC50462  
FANS "ON" - DRAINS PLUGGED - ALCOHOL HEATER

Station	Date	Time	OST	AIR Bunker H 1/ R 1/	AIR BBCL H	AIR BBCL R	AIR TDCL R	AIR TBCL H	TDCL R	TBCL H	BBCL R	BDCL R	BBCL R	MAX MIN.	COMMODITY	TOPS BOTTL
New Orleans	18															
"	18	4P	76°	595	595	580	635	585	615	610	600	570	585	61.5	57.0	60.8 57.5
"	18	5P	76°													
Jackson	19	5A	60°	615	610	605	620	610	615	625	620	600	605	62.5	60.0	62.0 60.5
"	19	6A	60°													
Memphis	19	2P	68°	630	625	625	640	625	630	635	630	620	625	63.5	62.0	63.2 62.5
Fulton	19	8P	65°	640	635	635	645	635	640	645	640	635	635	64.5	63.5	64.2 63.7
"	19	9P	65°													
Reevesville	20	2A	42°													
Bluford	20	5:30A	34°	505	575	540	580	580	575	590	580	580	600	60.0	57.0	58.0 58.7
"	20	6A	34°													
Chicago	20	5:30P	21°	585	575	595	590	595	595	595	595	585	600	60.0	58.5	59.5 59.3
E. Dubuque	21	8A	12°	565	565	580	570	570	585	575	580	585	590	59.0	57.0	58.0 58.2
"	21	9:30A	15°													
St. Paul	21	6P	16°	580	565	600	590	605	615	605	605	590	605	60.5	59.0	60.2 59.8
"	21	7P														
Fargo	22	4P	-19°	525	520	590	620	580	615	595	605	610	610	61.5	59.0	60.5 60.3
Noyes	23	11:30A	-15°	535	510	585	570	615	605	585	630	600	600	63.0	57.5	60.7 59.2
Winnipeg	23	4:30P	-10°	535	540	580	575	570	605	580	585	605	600	60.5	57.5	59.0 59.3
"	24	7A	-20°	430	435	535	655	515	630	595	620	580	590	63.0	58.0	61.5 58.7
"	24															

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago





CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. F - IC50398  
FANS "ON" - DRAINS OPEN - ALCOHOL HEATER

Station	Date	Time	OST	AIR		AIR	BBCL	AIR	TDCL	AIR	TBCL		BDCL	BBCL	C O M M O D I T Y			
				Bunker H 1/	R 1/	H	BBCL	H	TDCL	BDCL	H	R	H	R	MAX	MIN	AVE.	TOPS BOT.
New Orleans	18										Loaded 9:00 - 10:00 AM							
"	18	4P	76°	600	605	580	580	645	605	570	590	575	62.5	57.0	61.2	57.8		
"	18	5P	76°					One rear vent on iron - open 2"										
Jackson	19	5A	60°	615	615	610	610	625	615	620	605	610	62.0	60.5	61.7	60.8		
"	19	6A	60°					Both rear vents on irons - open 2"										
Memphis	19	2P	68°	635	640	630	630	645	630	635	630	630	64.5	63.0	63.7	63.0		
Fulton	19	8P	65°	645	650	645	640	650	640	640	645	640	64.5	64.0	64.2	64.1		
"	19	9P	65°					All vents open full - 11"										
Reevesville	20	2A	42°					Front vents closed - plugs attached - rear vents full open										
Bluford	20	5:30A	34°	505	540	555	580	575	575	575	605	590	595	60.5	56.5	57.2	59.7	
"	20	6A	34°					All vents closed - plugs in										
Chicago	20	5:30P	21°	565	540	585	580	595	575	585	590	590	585	59.5	57.5	58.5	58.8	
E. Dubuque	21	8A	12°	510	515	565	555	560	555	565	585	575	570	60.0	55.5	57.3	57.7	
"	21	9:30A	15°					Heaters lighted - thermostats at 57 1/2°										
St. Paul	21	6P	16°	570	560	595	590	605	585	600	595	590	585	62.5	58.5	60.3	59.0	
"	21	7P						Thermostats changed to 55°										
Fargo	22	4P	-19°	515	485	610	580	580	645	605	615	615	610	64.5	60.5	62.2	62.3	
Noyes	23	11:30A	-15°	580	570	605	595	590	590	600	645	610	605	64.5	59.0	59.5	62.0	
Winnipeg	23	4:30P	-10°	580	560	605	590	595	595	605	645	610	610	64.5	59.5	60.0	62.2	
"	24	7A	-20°	445	355	575	565	615	620	645	645	625	620	64.5	62.0	63.3	63.0	
"	24							Unloaded 7:45 - 8:05 and 8:40 - 9:10 AM										

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago





CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. G - I350477  
FANS "OFF" - DRAINS PLUGGED - ALCOHOL HEATER

Station	Date	Time	OST	AIR	AIR	AIR	AIR	AIR	BBCL	TDCL	BBCL	BDCL	BBCL	MAX	MIN	COM	MOD	ITY	AVE.	TOPS	BOTT.
	Jan.			H	I/	R	L/	H													
New Orleans	18																				
"	18	4P	76°	590	600	575	585	640	595	625	605	625	570	575	585	62.5	57.0	61.8	57.7		
"	18	5P	76°																		
Jackson	19	5A	60°	600	610	595	595	630	605	635	625	630	615	595	600	63.5	59.5	63.0	60.3		
Memphis	19	2P	68°	605	625	605	615	645	610	635	630	635	615	605	625	63.5	60.5	63.3	61.5		
Fulton	19	8P	65°	615	630	615	620	645	615	645	640	640	635	615	630	64.5	61.5	64.2	62.7		
"	19	9P	65°																		
Reevesville	20	2A	42°																		
Bluford	20	5:30A	34°	465	500	505	520	585	535	595	590	585	570	570	570	59.5	57.0	59.0	57.0		
"	20	6A	34°																		
Chicago	20	5:30P	21°	540	515	550	530	575	530	590	580	590	560	550	550	59.0	55.0	58.7	55.5		
E. Dubuque	21	8A	12°	505	505	520	520	550	490	580	570	575	535	540	540	58.0	53.5	57.5	53.8		
"	21	9:30A	15°																		
St. Paul	21	6P	16°	475	475	535	565	655	495	615	595	615	600	545	555	61.5	54.5	60.8	56.7		
Fargo	22	4P	-19°	395	385	515	525	665	470	630	605	635	550	550	565	63.5	55.0	62.3	55.8		
Noyes	23	11:30A	-15°	315	335	465	485	625	415	635	610	640	605	510	540	64.0	51.0	62.8	56.2		
Winnipeg	23	4:30P	-10°	325	355	460	450	605	410	615	595	620	595	490	615	62.0	49.0	61.0	56.7		
"	23	5P																			
"	24	9:30A	-18°	345	280	450	435	645	365	635	615	650	620	470	600	65.0	47.0	63.3	56.3		
"	24																				

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago.



CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. H - IC50451  
FANS "OFF" - DRAINS OPEN - ALCOHOL HEATER

Station	Date	Time	OST	AIR		AIR	BBCL	AIR		TBCL	TDCL	TBCL		BBCL	BDCL	BBCL		C O M M O D I T Y
				Bunker	H 1/ R 1/		BBCL	AIR	AIR									
	Jan.			H 1/ R 1/	H	BBCL	H	AIR	BBCL	H		R	H	R		MAX	MIN	AVE. AVE. TOPS BOTTS.
New Orleans	18																	
"	18	4P	76°	595	605	575	580	635	610	645	605	645	565	550	570	64.5	55.0	63.2 56.2
"	18	5P	76°					One rear vent on iron - open 2"										
Jackson	19	5A	60°	610	615	605	650	630	630	665	630	645	595	585	600	66.5	58.5	64.7 59.3
"	19	6A	60°					Both rear vents on irons - open 2"										
Memphis	19	2P	68°	615	630	615	620	655	640	680	630	620	615	605	615	68.0	60.5	64.3 61.2
Fulton	19	8P	65°	630	640	625	625	650	650	665	635	650	625	615	620	66.5	61.5	65.0 62.0
"	19	7P	65°					All vents open full - 11"										
Reevesville	20	2A	42°					Front vents closed - plugs attached - rear vents full open										
Bluford	20	5:30A	34°	470	500	490	520	585	565	630	590	605	560	580	550	63.0	55.0	60.8 56.3
"	20	6A	34°					All vents closed - plugs in										
Chicago	20	5:50P	21°	540	520	565	545	585	580	625	585	605	565	570	555	62.5	55.5	60.5 56.3
E. Dubuque	21	8A	12°	480	510	510	535	555	590	560	585	585	525	545	545	59.0	52.5	57.8 53.8
"	21	9:50A	15°					Heaters lighted - thermostat at 57 1/2°										
St. Paul	21	6P	16°	460	470	550	555	645	635	590	615	615	560	560	560	63.5	56.0	61.3 56.0
Fargo	22	4P	-19°	310	380	515	555	665	610	610	565	565	565	585	585	61.0	56.5	58.8 57.8
Noyes	23	11:50A	-15°	280	330	475	560	580	540	590	590	525	525	495	515	59.0	49.5	56.5 51.2
Winnipeg	23	4:30P	-10°	305	345	480	500	620	605	640	510	510	510	555	555	64.0	51.0	62.3 54.0
"	24	10P	-17°	440	450	515	475	580	600	625	510	510	510	545	520	62.5	51.0	61.3 52.5
"	24							Unloaded 1:05 - 2:35 PM										

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago.





CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. J - Brex 74398  
FANS "ON" - DRAINS PLUGGED - UNDERSLUNG  
HEATER - THERMOSTATICALLY CONTROLLED

Station	Date	Time	OST			AIR			AIR			TBCL			TBCL			BBCL			BBCL			BDCL			BDCL			MAX			C O M M O D I T Y		
			H	AIR	R	H	AIR	R	H	AIR	R	H	AIR	R	H	AIR	R	H	AIR	R	H	AIR	R	H	AIR	R	H	AIR	R	TOPS	AVE.	BOTT.			
New Orleans	18		Loaded 11:05 - 12:05 PM																																
"	18	4P	76°	600	605	580	585	655	600	625	615	630	575	570	580	63.0	57.0	62.3	57.5																
"	18	5P	76°	One rear vent on iron - open 2"																															
Jackson	19	5A	60°	610	620	610	615	625	615	615	620	615	610	605	605	62.0	60.5	61.7	60.7																
"	19	6A	60°	Both rear vents on irons - open 2"																															
Memphis	19	2P	68°	635	640	635	640	650	630	640	645	640	630	630	630	64.5	63.0	64.2	63.0																
Fulton	19	8P	65°	645	645	645	645	650	640	650	645	645	645	640	635	65.0	63.5	64.7	64.0																
"	19	9P	65°	All vents open full - 11"																															
Reevesville	20	2A	42°	Front vents closed-plugs attached-rear vents full open																															
Bluford	20	5:30A	34°	505	505	545	580	575	565	575	580	585	590	585	59.0	56.5	57.3	58.7																	
"	20	6A	34°	All vents closed - plugs																															
Chicago	20	5:30P	21°	570	570	585	585	580	575	580	585	585	585	585	585	58.5	58.5	58.3	58.5																
E. Dubuque	21	8A	12°	535	535	555	555	555	530	560	555	555	565	565	560	56.5	55.5	55.7	56.3																
"	21	9:30A	15°	Heater lighted - thermostat at 55°																															
St. Paul	21	6P	16°	550	550	575	560	555	560	565	565	555	570	565	560	57.0	55.5	56.2	56.5																
Fargo	22	4P	-19°	490	490	525	530	540	525	550	545	540	555	555	545	55.5	54.0	54.5	55.2																
Grand Forks	23	1A	-25°	Thermostats set up to 60°																															
Noyes	23	11:30A	-15°	465	465	495	485	495	485	505	500	485	505	500	495	50.5	48.5	49.7	50.0																
"	23	12N		Two burning portable charcoal heaters placed in bunkers																															
Winnipeg	23	4:30P	-10°	550	550	540	525	655	500	585	560	575	525	520	525	58.5	52.0	57.3	52.3																
"	23	5P		Draft set at zero on underslung																															
"	24	7A	-20	375	375	510	510	605	450	605	565	605	540	525	525	60.5	52.5	59.2	53.0																
"	24			Unloaded 7:15 - 7:50 AM																															

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago.





CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. K - BREX 74399  
FANS "ON" - DRAINS PLUGGED - UNDERSLUNG HEATER

Station	Date	Time	OST	AIR		AIR	BBCL	AIR	BBCL	AIR	BDCL	AIR	TBCL	TDCL	TBCL	BBCL	BDCL	COMMODITY	
				BUNKER	H													MAX	MIN
	Jan.			H 1/2	R 1/2		H		R	H		R	H		R				
New Orleans	18																		
"	18	4P	76°	615		590	590	650	595	650	630	615	585	575	65.0	57.5	63.2	57.8	
"	18	5P																	
Jackson	19	5A	60°	625		615	615	615	615	640	630	620	615	610	64.0	61.0	63.3	61.5	
"	19																		
Memphis	19	2P	68°	640		635	635	645	630	655	645	640	635	630	65.5	63.0	65.0	63.5	
Fulton	19	8P	65°	650		645	645	645	645	665	660	655	650	645	66.5	64.5	66.0	64.7	
"	19	9P																	
Reevesville	20	2A	42°																
Bluford	20	5:30A	34°	590		545	565	580	560	595	590	605	600	575	60.5	57.0	58.5	59.3	
"	20	6A																	
Chicago	20	5:30P	21°	580		585	580	575	580	595	590	585	590	585	59.5	58.0	59.0	58.5	
E. Dubuque	21	8A	12°	545		560	550	550	540	580	570	570	580	575	58.0	56.5	57.3	57.3	
"	21	9:30A	15°																
St. Paul	21	6P	16°	565		575	555	550	555	585	585	560	575	565	58.5	56.0	57.7	57.0	
Fargo	22	4P	-19°	525		585	560	560	540	590	570	590				570	59.0	57.0	57.3
Noyes	23	11:30A	-15°	485		510	500	500	490	530	520	555	535	535	55.5	52.0	53.5	53.2	
Winnipeg	23	4:30P	-10°	490		510	500	495	500	530	520	530	530	530	53.0	51.0	52.3	52.3	
Saskatoon	26		-8°																

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago.



CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. AA - IC50086  
FANS "ON" - DRAINS PLUGGED - UNDERSLUNG HEATER

Station	Date	Time	OST	AIR			AIR			AIR	TBCL			TBCL			BBCL	COMMODITY			TOS	BOT.			
				BUNKER	H	L	R	H	L		R	H	L	R	MAX	MIN		AVE.							
	Jan.			H	L	R	H	L	R		H	L	R	H	L	R									
New Orleans	18			Loaded 9:10 - 10:05 AM																					
"	18	4P	76°	595	605	585	585	585	630	590	620	600	620	580	570	580	580	580	580	580	62.0	57.0	61.3	57.7	
"	18	5P		One rear vent on iron - open 2"																					
Jackson	19	5A	60°	615	615	605	615	615	620	600	620	620	605	605	605	605	605	605	605	605	62.0	60.5	61.8	60.5	
"	19			Both rear vents on irons - open 2"																					
Memphis	19	2P	68°	630	635	625	630	630	640	610	630	630	625	625	625	625	625	625	625	625	63.0	62.5	63.0	62.5	
Fulton	19	8P	65°	640	640	635	640	640	645	620	635	635	640	635	635	635	635	635	635	630	64.0	63.0	63.7	63.3	
"	19	9P		All vents open full - 11"																					
Reevesville	20	2A	42°	Front vents closed - plugs attached - rear vents full open																					
Bluford	20	5:30A	34°	490	540	535	535	535	580	545	555	585	580	570	590	590	590	590	590	535	59.0	53.5	57.3	56.5	
"	20	6A		All vents closed - plugs in																					
Chicago	20	5:30P	21°	575	550	550	580	550	570	550	575	580	585	580	585	585	585	585	585	555	58.5	55.5	58.0	57.3	
E. Dubuque	21	8A	12°	550	530	535	565	565	550	530	560	565	565	570	575	575	575	575	575	550	57.5	55.0	56.3	56.5	
"	21	9:30A	15°	Heater lighted																					
St. Paul	21	6P	16°	575	540	545	585	545	570	555	575	570	565	575	575	575	575	575	550	57.5	55.0	57.0	56.7		
Fargo	22	4P	-19°	525	540	530	555	530	565	540	570	580	575	585	595	595	595	595	565	59.5	56.5	57.5	58.2		
Noyes	23	11:30A	-15°	515	490	495	540	495	520	515	535	540	540	545	555	555	555	555	525	55.5	52.5	53.8	54.2		
Winnipeg	23	4:30P	-10°	515	490	495	535	495	525	515	530	535	535	540	545	545	545	545	515	54.5	51.5	53.3	53.3		
Saskatoon	25		-5°	Unloaded 4:00 - 4:55 PM																					

Note L/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago.















CORRECTED AIR AND COMMODITY TEMPERATURES

Car No. DD - TC50359  
FANS "OFF" - DRAINS OPEN - UNDERSLUNG HEATER

Station	Date	Time	COMMODITY														
			OST	AIR	AIR	AIR	AIR	AIR	BBCL	BBCL	BDCL	BDCL	MAX	MIN	AVE.	TOPS	BOTTL
Jan.																	
New Orleans	18		Loaded 8:00 - 9:05 AM														
"	18	4P	76°	605	605	635	635	605	635	620	625	580	570	580	63.5	57.0	62.7 57.7
"	18	5P						One rear vent on iron - open 2"									
Jackson	19	5A	60°	615	610	625	625	615	640	645	625	600	595	605	64.5	59.5	63.7 60.0
"	19							Both rear vents on irons - open 2"									
Memphis	19	2P	68°	625	660	640	625	620	645		630	620	615	620	64.5	61.5	63.8 61.8
Fulton	19	8P	65°	635	640	640	630	625	650		635	625	625	630	65.0	62.5	64.3 62.7
"	19	9P						All vents open full - 11"									
Reevesville	20	2A	42°					Front vents closed - plugs attached - rear vents full open									
Bluford	20	5:30A	34°	475	450	505	500	470	465	605	515	565	585	490	60.5	49.0	56.0 54.7
"	20	6A						All vents closed - plugs in									
Chicago	20	5:30P	21°	565	520	575	570	550	545	605	585	565	575	565	60.5	56.5	59.5 56.8
E. Dubuque	21	8A	12°	525	500	555	540	540	510	595	565	550	565	550	59.5	55.0	58.0 55.5
"	21	9:30A	15°					Heater lighted									
St. Paul	21	6P	16°	510	525	540	535	530	520	585	560	535	560	540	58.5	53.5	57.3 54.5
Fargo	22	4P	-19°	465	480	530	500	500	485	590	545	520	555	525	59.0	52.0	56.2 53.3
Noyes	23	11:30A	-15°	465	460	515	480	470	485	535	515	485	530	495	55.0	48.5	53.3 50.3
Winnipeg	23	4:30P	-10°	465	460	515	480	485	475	535	515	480	525	490	53.5	48.0	52.5 49.8
Edmonton	26		-8°					Unloaded - 9:00 AM									

Note 1/ Head and rear as indicated are from Chicago to Winnipeg - cars were reversed from New Orleans to Chicago.



Table 17

## HEATER INSPECTION DATA

Test Code No. A Fans On Drains Plugged Heater Luminator-Mitchel  
 Car No. IC 50242 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway		Burner Operation	Fuel added	Fuel in heater	Remarks
				Pulp	Temp				
	Jan.			T	B				
E. Dubuque, Ill.	21	9:30A	16°	56	56	Lit	-	40 lbs.	draft set at 2
St. Paul, Minn.	21	6P	19°	56.5	57	B	20 lbs.	-	
Fargo, N. D.	22	4P	-16°	57	57	B	-	-	
Grand Forks, N.D.	23	1A	-25°	-	-	B	20 lbs.	-	
Noyes, Minn.	23	11:30A	-15°	55	55	B	-	-	draft set to 7
Winnipeg, Man.	23	5P	-10°	-	-	B	-	-	
" "	24	10A	-18°	55	57	B	-	5 lbs.	draft set to 0
Total fuel burned								75 lbs.	





Table 18

## HEATER INSPECTION DATA

Test Code No. B  
 Car No. IC 50112

Fans On Drains Open Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date Jan.	Time	OST °F	Doorway Pulp Temp		Burner Opera- tion	Fuel added	Fuel in heater	Remarks
				T	B				
E. Dubuque, Ill.	21	9:30A	16°	55	55	Lit	-	.40 lbs.	draft set at 2
St. Paul, Minn.	21	6P	19°	55	55	B	20 lbs.	-	-
Fargo, N.D.	22	4P	-16°	55	55	B	-	-	draft set to 4
Grand Forks, N.D.	23	1A	-25°	-	-	B	20 lbs.	-	-
Noyes, Minn.	23	11:30A	-15°	53	54	B	-	-	draft set to 7
Winnipeg, Man.	23	5P	-10°	-	-	B	-	-	-
" "	24	10A	-18°	53	53	B	-	20 lbs.	draft set to 0

Total fuel burned - 60 lbs.



Table 19

## HEATER INSPECTION DATA

Test Code No. C  
 Car No. IC 50055

Fans Off Drains Plugged

Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway Pulp temp.	Burner Opera- tion	Fuel added	Fuel in heater	Remarks
	Jan.			T B				
E. Dubuque, Ill.	21	9:30A	16°	56 56	Lit	-	40 lbs.	draft set at 2
St. Paul, Minn.	21	6P	19°	55 55	B	20 lbs.	-	-
Fargo, N. D.	22	4P	-16°	56 55.5	B	-	-	-
Grand Forks	23	1A	-25°	- -	B	20 lbs.	-	-
Noyes, Minn.	23	11:30A	-15°	56 56	B	-	-	draft set to 4
Winnipeg, Man.	23	5P	-10	- -	B	-	-	draft set to 7
" "	24	10A	-18°	55 53	B	-	20 lbs.	draft set to 0

Total fuel burned - 60 lbs.





•

## A

Heater Luminator-Mitchel  
Placement Underslung

[illegible]



Table 21

## HEATER INSPECTION DATA

Test Code No. E Thermostat Setting 57 1/2° Heater Preco Alcohol  
 Car No. IC 50462 Fans On Drains Plugged Placement one each bunker (1)

Inspected at	Date	Time	OST °F	Temp. at Thermo- stat (2) Head	Burner		Fuel		Fuel in		Fuel con-		Remarks
					Opera-		added		heater		sumed		
					(3)		gals.		gals.		from last		
Jan.					H	R	H	R	H	R	H	R	
E. Dubuque, Ill.	21	9:30A	16°	-	B	B	-	-	5.0	5.0	-	-	Both heaters lit
La Crosse, Wis.	21	1:30P	20°	57°	B	B	-	-	4.5	4.5	0.5	0.5	- - -
St. Paul, Minn.	21	7P	18°	56°	P	P	-	-	4.2	4.2	0.3	0.3	Thermostat re-set to 55°
Fargo, N. D.	22	4P	-16°	55°	P	P	-	-	3.5	3.3	0.7	0.9	- - -
Grand Forks	23	1A	-25°	-	-	-	2.0	2.0	-	-	-	-	- - -
Noyes, Minn.	23	11:30A	-15°	54°	P	D	-	-	4.6	4.5	-	-	Rear heater re-lit on full burning (4)
Winnipeg, Man.	23	5P	-10°	53°	P	D	-	-	4.3	4.1	0.3	0.4	Rear heater wick scraped, re-lit (4)
" "	24	8A	-18°	50°	B	B	-	-	3.6	3.2	0.7	0.9	Heater extinguished
Total Fuel burned					Head		3.4		3.8				
					Rear		3.8						

Car total 7.2

Notes (1) Heater Numbers - Head - IC 25

Rear - IC 24

(2) At thermostat level on ice grate - head end only

(3) B-full burning, P-pilot, D-dark, not burning

(4) In both cases, heater vent on full burning after re-lighting





Table 22

## HEATER INSPECTION DATA

Test Code No. F Thermostat Setting 57 1/2° Heater Preco Alcohol  
 Car No. IC 50398 Fans on Drains open Placement one each bunker(1)

Inspected at	Date	Time	OST Temp.		Burner		Fuel		Fuel in		Fuel		Remarks
			°F	at	Opera-	added	heater	consumed	gals.	gals.	from last	gals.	
			Thermo-	stat	(2)	(3)	H	R	H	R	H	R	
E. Dubuque, Ill.	21	9:30A	16°	--	--	B B	-	-	5.0	5.0	-	-	Heaters lit
La Crosse, Wis.	21	1:30P	20°	57°	56°	B B	-	-	4.5	4.5	0.5	0.5	
St. Paul, Minn.	21	7P	18°	58°	57°	B B	-	-	4.05	4.1	0.45	0.4	Thermostats re-set to 55°
Fargo, N. D.	22	4P	-16°	54°	56°	B P	-	-	2.5	3.4	1.55	0.7	Rear heater Thermo. found on 52 1/2 re-set 55
Grand Forks	23	1A	-25°	-	-	-	-	-	2.75	2.0	-	-	
Noyes, Minn.	23	11:30A	-15°	57°	55°	B B	-	-	4.2	4.3	-	-	
Winnipeg, Man.	23	5P	-10°	56°	55°	B B	-	-	3.9	4.3	0.3	0.1	
" "	24	8A	-18°	45°	45°	B B	-	-	3.0	3.0	0.9	1.2	Heaters extinguished

Total fuel burned Head - 4.75

Rear - 4.0

Car Total 8.75

Notes - (1) Heater nos. Head - IC-20

Rear - IC-19

(2) At thermostat level on ice grates

(3) B-full burning P-Pilot



Table 23

## HEATER INSPECTION DATA

Test Code No. G  
 Car No. IC 50477

Thermostat Setting 57 1/2°  
 Fans Off Drains Plugged

Heater Preco alcohol  
 Placement one each bunker (1)

Inspected at	Date	Time	OST °F	Temp. at Thermo- stat (2)	Burner Opera- tion (3)	Fuel added gals.	Fuel in heater gals.	Fuel consumed from last inspection gals.	Remarks
	Jan.			Head	H R	H R	H R	H R	
E. Dubuque, Ill.	21	9:30A	16°	-	B B	- -	4.8 4.8	- -	Heaters lit
La Crosse, Wis.	21	1:30P	20°	51°	B B	- -	4.4 4.4	0.4 0.4	
St. Paul, Minn.	21	7P	18°	52°	B B	- -	4.0 4.0	0.4 0.4	
Fargo, N. D.	22	4P	-16°	50°	B B	- -	2.7 2.7	1.3 1.3	
Grand Forks	23	1A	-25°	-	- -	2.5 3.0	- -	- -	
Noyes, Minn.	23	11:30A	-15°	47°	B B	- -	4.0 4.1	- -	
Winnipeg, Man.	23	5P	-10°	48°	B B	- -	3.85 4.0	0.15 0.1	Thermostats re- set to 55°
" "	24	9:30A	-18°	52°	B B	- -	3.2 2.7	0.65 1.3	Heaters extin- guished 3 PM
Total fuel burned						Head	4.1		
						Rear	5.1		
						Car total	9.2		

Notes (1) Heater numbers Head IC 12  
 Rear IC 11

(2) At thermostat level on ice grates - head end only  
 (3) B-full burning P-pilot





Table 24

## HEATER INSPECTION DATA

Test Code No. H Thermostat Setting 57 1/2° Heater Preco alcohol  
 Car No. IC 50451 Fans Off Drains Open Placement one each end (1)

Inspected at	Date	Time	OST °F	Temp. at thermo- stat (2) Head	Burner Opera- tion (3) H R	Fuel added gals. H R	Fuel in heater gals. H R	Fuel consumed from last inspection gals. H R	Remarks
	Jan.								
E. Dubuque, Ill.	21	9:30A	16°	-	B B	- -	5.0 4.8	- -	Heaters lit
La Crosse, Wis.	21	1:30P	20°	52°	B B	- -	4.7 4.4	0.3 0.4	
St. Paul, Minn.	21	7P	18°	55°	B B	- -	4.15 4.05	0.55 0.35	
Fargo, N. D.	22	4P	-16°	48°	B B	- -	2.75 3.0	1.4 1.05	
Grand Forks	23	1A	-25°	-	- -	2.5 2.25	- -	- -	
Noyes, Minn.	23	11:30A	-15°	49°	B B	- -	4.0 4.2	- -	
Winnipeg, Man.	23	5P	-10°	50°	B B	- -	3.85 4.0	0.15 0.2	
" "	24	2P		52°	D (4) PB (4)		3.3 3.5	0.55 0.5	Heaters extin- guished

Total fuel burned Head 4.2  
 Rear 3.55  
 Car total 7.75

Notes (1) Heater numbers Head IC 14  
 Rear IC 4

- (2) At thermostat level on ice grates - head end only  
 (3) B-full burning PB-partial burning D-dark, flame out  
 (4) Front heater out, could not be re-lit. Rear heater, only  
 partial flame on wick. Both wicks covered with crust.



Table 25

## HEATER INSPECTION DATA

Test Code No. J  
 Car No. BREX 74398

Thermostat Setting 55°  
 Fans On Drains Plugged

Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway pulp temp.		Burner opera- tion	Fuel added	Fuel in heater	Remarks
	Jan.			T	B				
E. Dubuque, Ill.	21	9:30A	16°	55	54	Lit	-	40 lbs.	Draft set at 4
St. Paul, Minn.	21	6P	19°	55	56	B	20 lbs.	-	- - -
Fargo, N. D.	22	4P	-16°	54.5	55	B	20 lbs.	-	Draft set to 6
Grand Forks	23	1A	-25°	52.5	52	B	20 lbs.	-	Thermostat set up to 60°
Noyes, Minn.	23	11:30A	-15°	49	50	B	-	-	Draft set to 7, 2 portable charcoal heaters placed one each bunker-burning
Winnipeg, Man.	23	5P	-10°	53	52	B	-	-	Draft set at 0
" "	24	10A	-18°	56	53	D	-	30 lbs.	Portable heaters burn- ing

Total fuel burned 70# (underslung only)  
 no record of fuel burned by portable heaters.





Table 26

## HEATER INSPECTION DATA

Test Code No. K  
 Car No. BREX 74399

Fans On Drains Plugged

Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway pulp temp.		Burner opera- tion	Fuel added	Fuel in heater	Remarks
	Jan.			T	B				
E. Dubuque, Ill.	21	9:30A	16°	56	56	Lit	-	40 lbs.	draft set at 2
St. Paul, Minn.	21	6P	19°	55	55	B	20 lbs.	-	- - -
Fargo, N. D.	22	4P	-16°	56	56	B	-	-	- - -
Grand Forks	23	1A	-25°	-	-	B	20 lbs.	-	- - -
Noyes, Minn.	23	11:30A	-15°	51	51	B	-	-	draft set to 7
Winnipeg, Man.	23	5P	-10°	-	-	B	-	-	- - -

Car forwarded to Saskatoon - no further record.



Table 27

## HEATER INSPECTION DATA

Test Code No. AA  
 Car No. IC 50086

Fans On Drains Plugged

Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway pulp temp.		Burner opera- tion	Fuel added	Fuel in heater	Remarks
	Jan.			T	B				
E. Dubuque, Ill.	21	9:30A	16°	56	56	Lit	-	40 lbs.	Draft set at 2
St. Paul, Minn.	21	6P	19°	58	58	B	20 lbs.	-	
Fargo, N. D.	22	4P	-16°	58	58	B	-	-	
Grand Forks	23	1A	-25°	-	-	B	20 lbs.	-	
Noyes, Minn.	23	11:30A	-15°	55.5	54	B	-	-	Draft set to 7
Winnipeg, Man.	23	5P	-10°	54	55	B			

Car forwarded to Saskatoon - no further record





Table 28

## HEATER INSPECTION DATA

Test Code No. BB  
 Car No. IC 50225

Fans On Drains Open

Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway pulp temp.	Burner Fuel opera- tion	Fuel added	Fuel in heater	Remarks	
	Jan.			T	B				
E. Dubuque, Ill.	21	9:30A	16°	56	56	Lit	-	40 lbs.	Draft set at 2
St. Paul, Minn.	21	6P	19°	56	56	B	20 lbs.	-	
Fargo, N. D.	22	4P	-16°	57	57	B	-	-	
Grand Forks	23	1A	-25°	-	-	B	20 lbs.	-	
Noyes, Minn.	23	11:30A	-15°	54	53	B	-	-	Draft set to 7
Winnipeg, Man.	23	5P	-10°	-	-	B	-	-	Drains plugged

Car forwarded to Saskatoon - no further record



Table 29

## HEATER INSPECTION DATA

Test Code No. CC  
 Car No. IC 50357

Fans Off Drains Plugged Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway pulp temp.	Burner opera- tion	Fuel added	Fuel in heater	Remarks
	Jan.			T	B			
E. Dubuque, Ill.	21	9:30A	16°	58	57	Lit	-	40 lbs. Draft set at 1
St. Paul, Minn.	21	6P	19°	57	57	B	20 lbs.	- Draft set to 2
Fargo, N. D.	22	4P	-16°	57.5	57.5	B	-	-
Grand Forks	23	1A	-25°	-	-	B	20 lbs.	-
Noyes, Minn.	23	11:30A	-15°	56	55	B	-	- Draft set to 7
Winnipeg, Man.	23	5P	-10°	-	-	B	-	- Fans ON

Car forwarded to Edmonton - no further record



Table 30

## HEATER INSPECTION DATA

Test Code No. DD  
 Car No. IC 50359

Fans Off Drains Open

Heater Luminator-Mitchel  
 Placement Underslung

Inspected at	Date	Time	OST °F	Doorway pulp temp.		Burner opera- tion	Fuel added	Fuel in heater	Remarks
	Jan.			T	B				
E. Dubuque, Ill.	21	9:30A	16°	57	57	Lit	-	40 lbs.	Draft set at 1
St. Paul, Minn.	21	6P	19°	55	54.5	D	20 lbs.	-	Heater out, re-lit draft set to 2
Fargo, N. D.	22	4P	-16°	54	53	B	-	-	Draft set to 6
Grand Forks	23	1A	-25°	-	-	B	20 lbs.	-	
Noyes, Minn.	23	11:30A	-15°	54.5	53	B	-	-	
Winnipeg, Man.	23	5P	-10°	-	-	B			Fans ON, drains plugged-draft set to 7
Car forwarded to Edmonton									- no further record





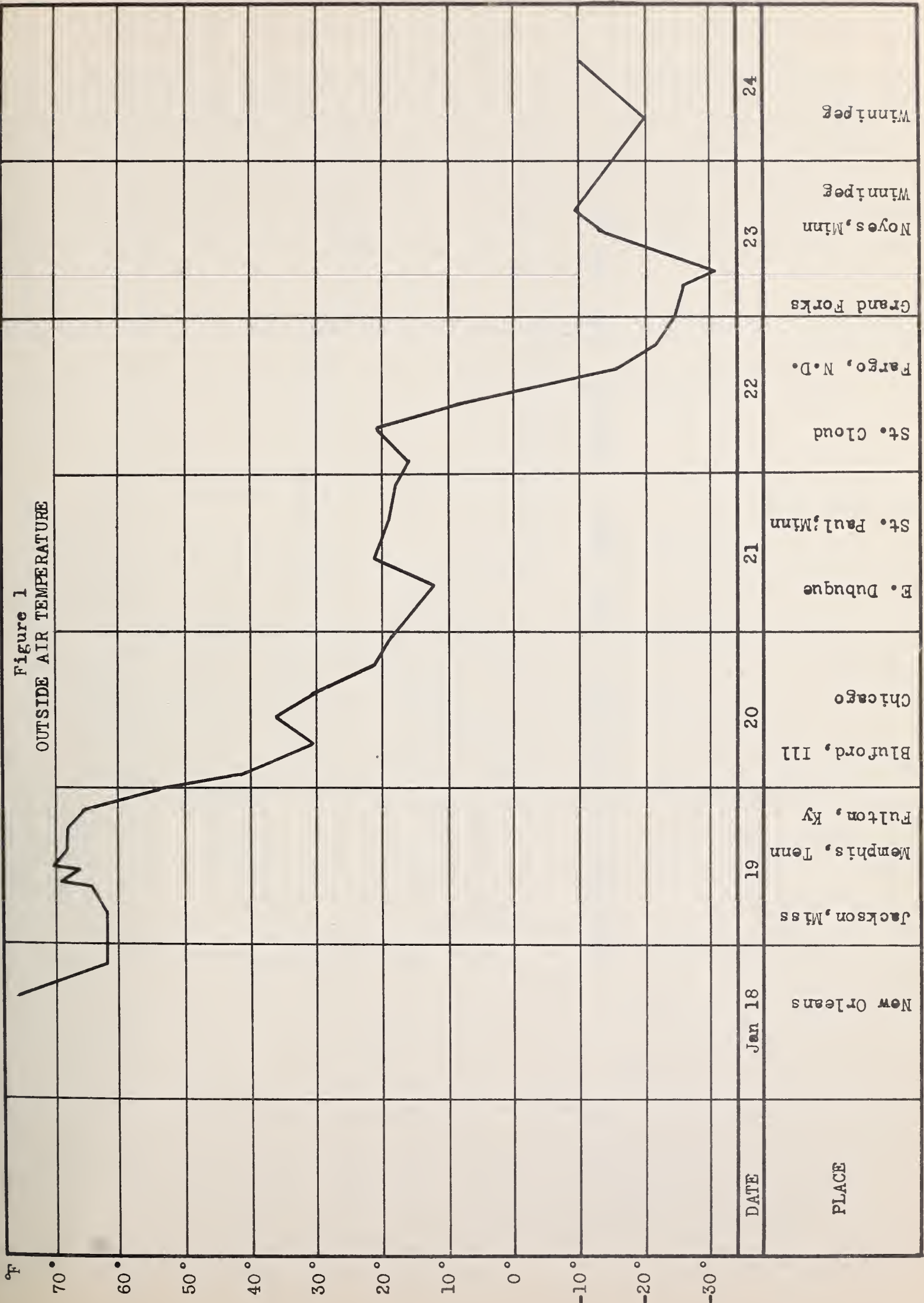


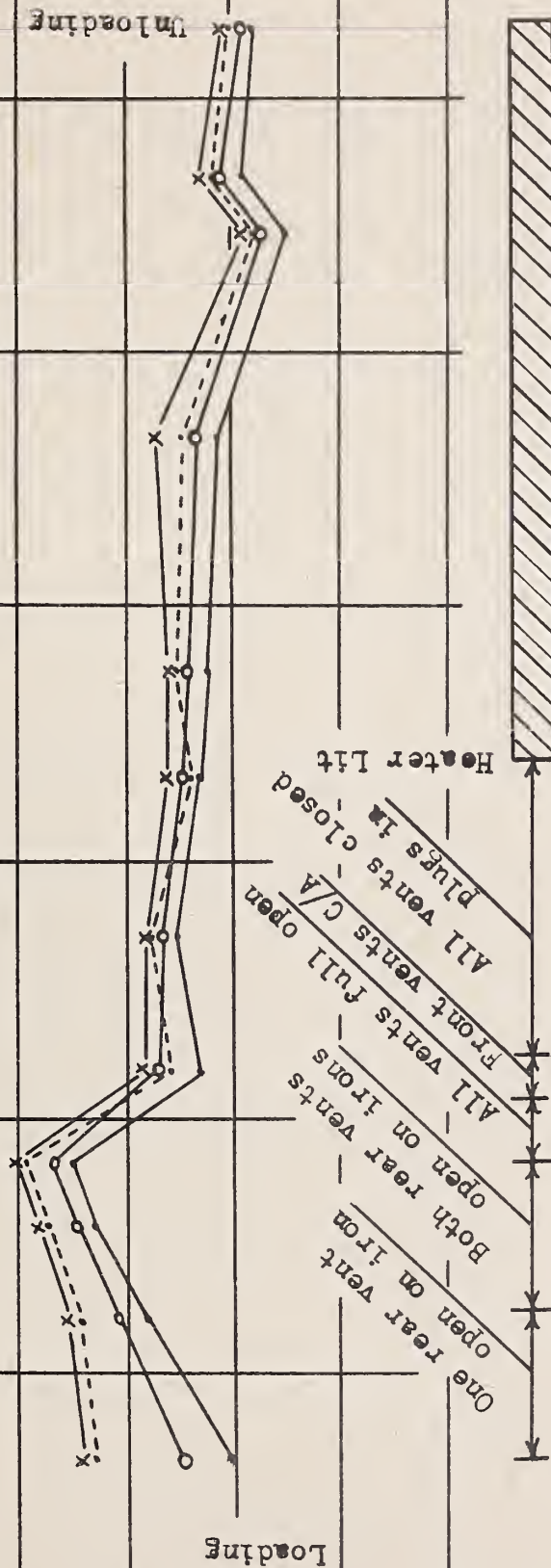
Figure 1  
OUTSIDE AIR TEMPERATURE



Figure 2  
Car A IC 50242  
Underslung Heater  
Fans "ON" - Drains Plugged

°F  
70  
65  
60  
55  
50  
45

x — Max  
— Min  
- - - - - AV Top  
o — AV Bot



Vent and

Heater Record

Fan Operation

Outside Air

Temperature

Date

Place

Max 76°  
Min 62°

Jan 18

New Orleans, La

Jackson, Miss

Memphis, Tenn

Fulton, Ky

Bluford, Ill

Chicago

E. Dubuque, Ill

St. Paul, Minn

Fargo, N.D.

Noyes, Minn

Winnipeg, Man

Winnipeg

24

23

22

21

20

19

-10°

21°

21°

54°

70°

12°

18°

54°

-25°

-31°

-20°





x — x Max  
 — Min  
 - - - - - Av Top  
 o — o Av Bot

Figure 3  
 Car B IC 50112  
 Underslung Heater  
 Fans "ON" - Drains Open

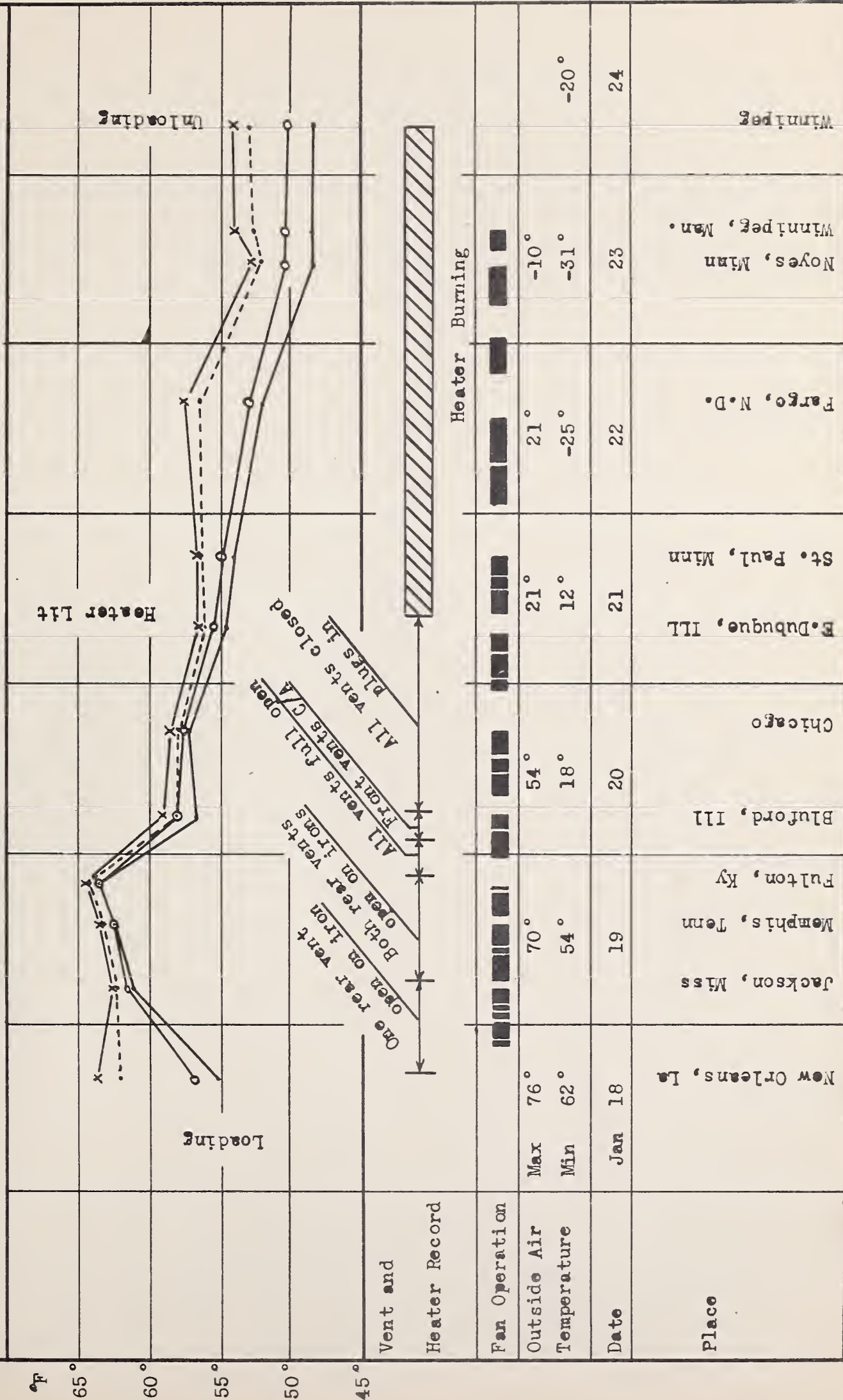




Figure 4  
Car C IC 50055  
Underslung Heater  
Fans "OFF" - Drains Plugged

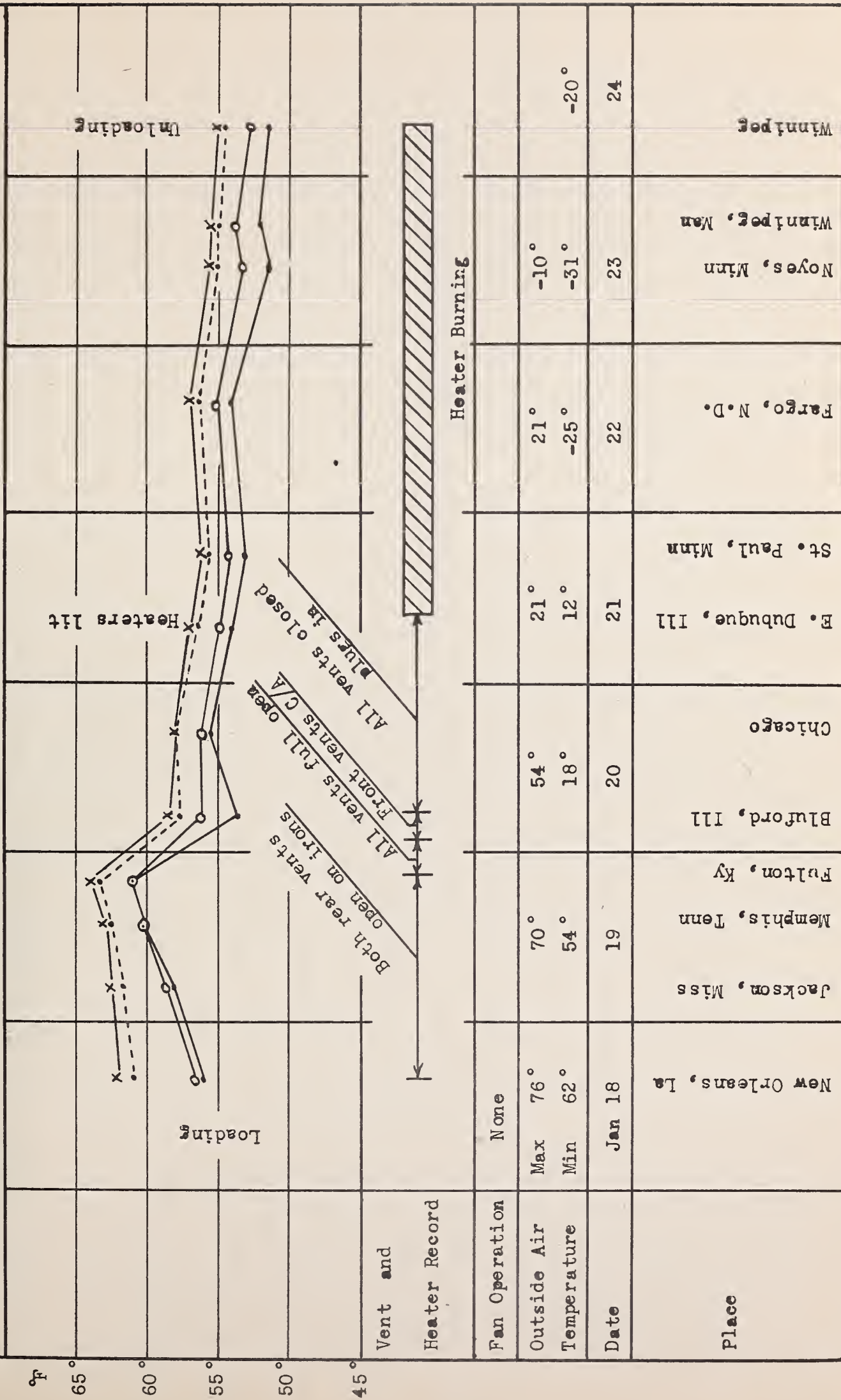






Figure 5  
Car D IC 50192  
Underslung Heater  
Fans "Off" - Drains Open

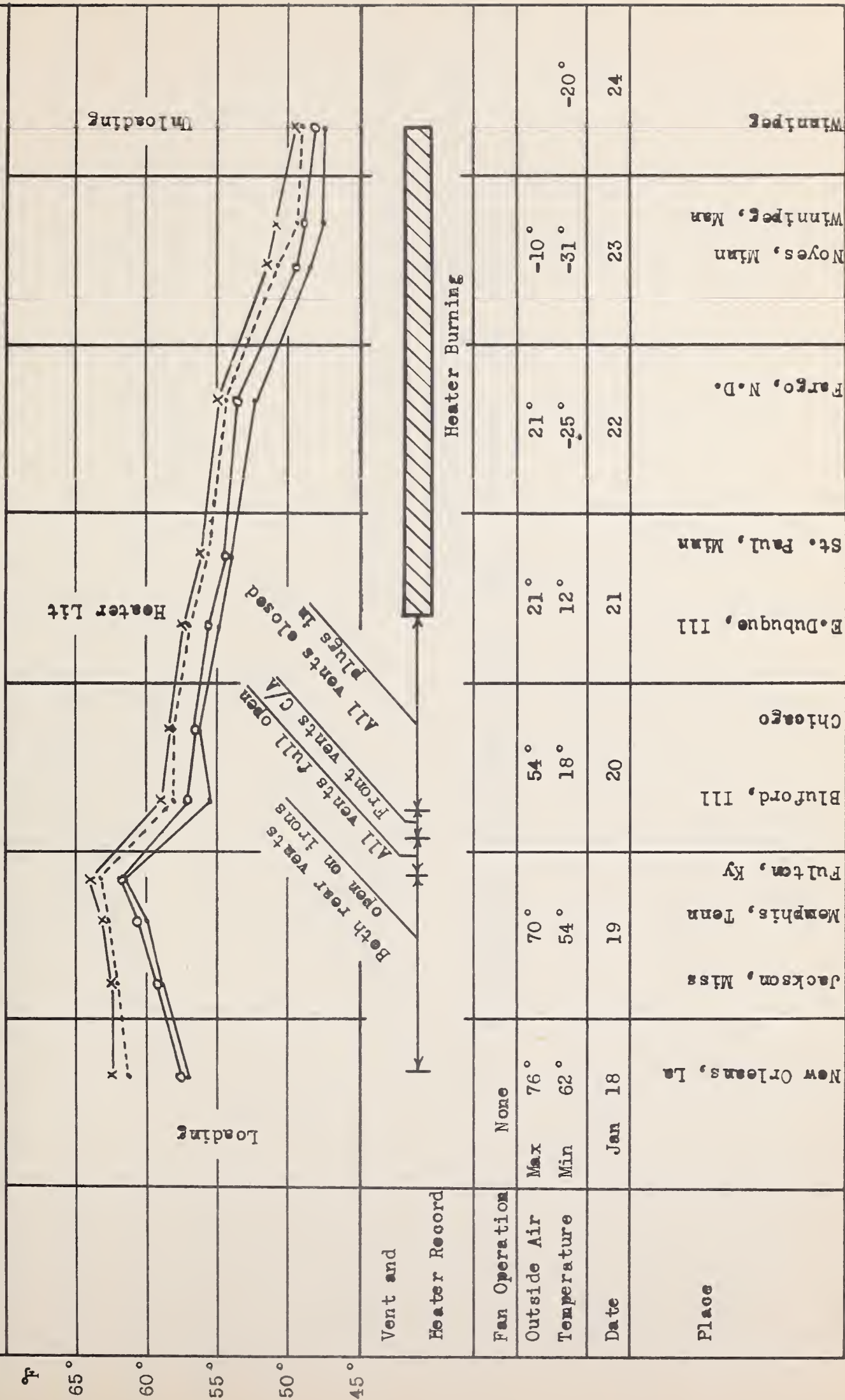




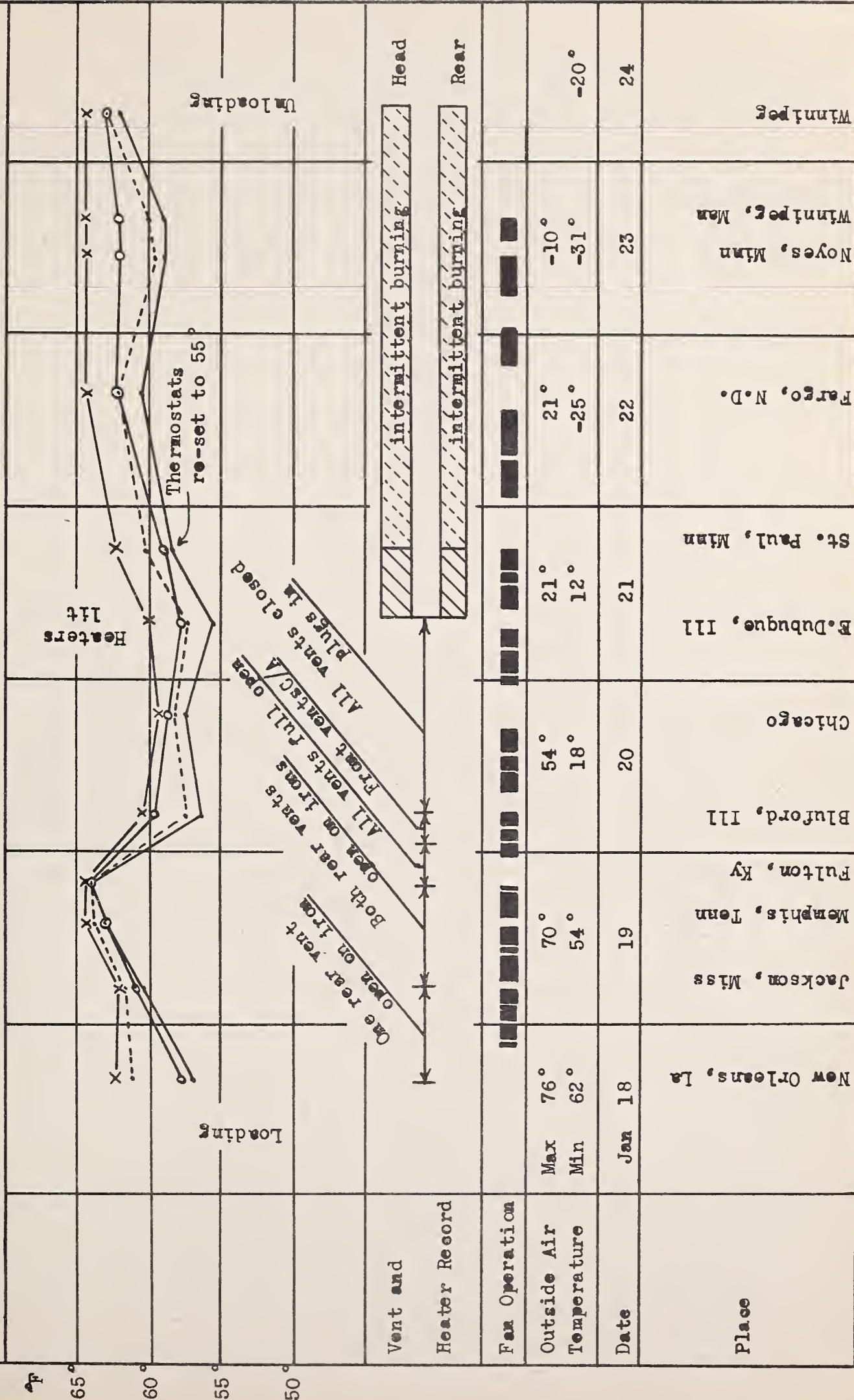






Figure 7  
Car F IC 50398  
Alcohol Heaters  
Fans "ON" - Drains Open

Thermostats set at  $57\frac{1}{2}^{\circ}$   
One heater each end





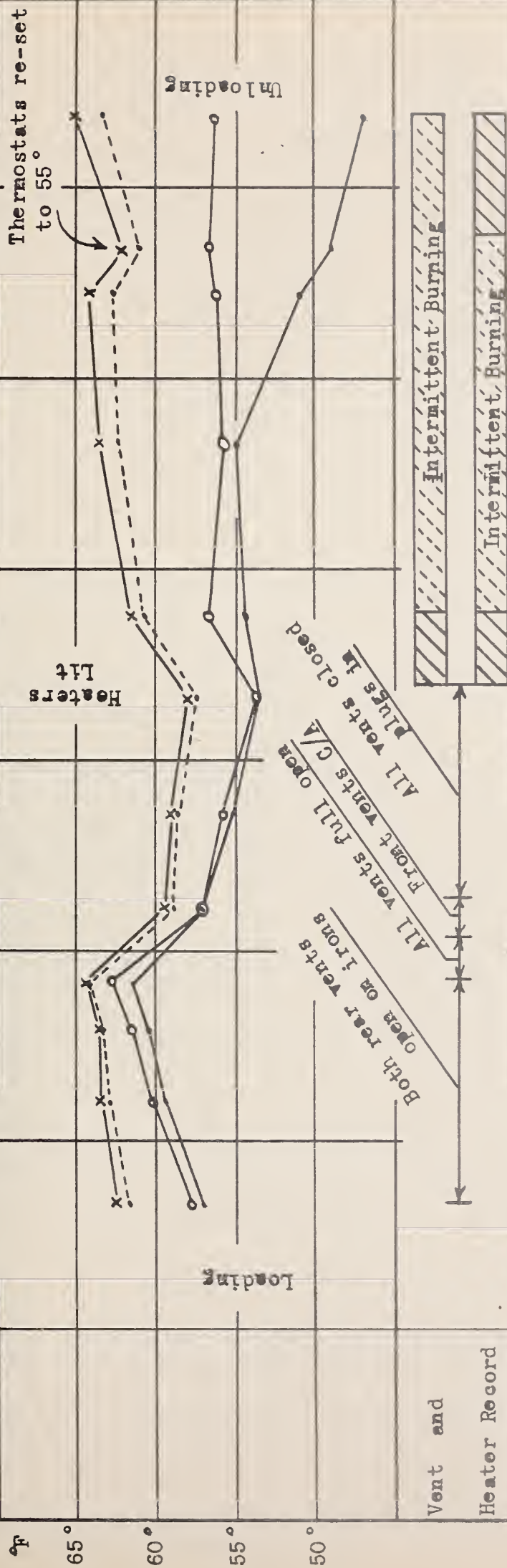




x—x Max  
 — Min  
 - - - Av Top  
 o—o Av Bot

Figure 8  
 Car G IC 50477  
 Alcohol Heaters  
 Fans "OFF" - Drains Plugged

Thermostats set  $57\frac{1}{2}^{\circ}$   
 One heater each end



Vent and Heater Record

Fan Operation

None

Max

Min

Outside Air

Temperature

Date

Place

76°  
 62°

Jan 18

70°  
 54°

54°  
 18°

21°  
 12°

21°  
 -25°

-10°  
 -31°

-20°

24

New Orleans, La

Jackson, Miss

Memphis, Tenn

Fulton, Ky

Bluford, Ill

Chicago

E. Dubuque, Ill

St. Paul, Minn

Fargo, N.D.

Noyes, Minn

Winnipeg, Man

Winnipeg



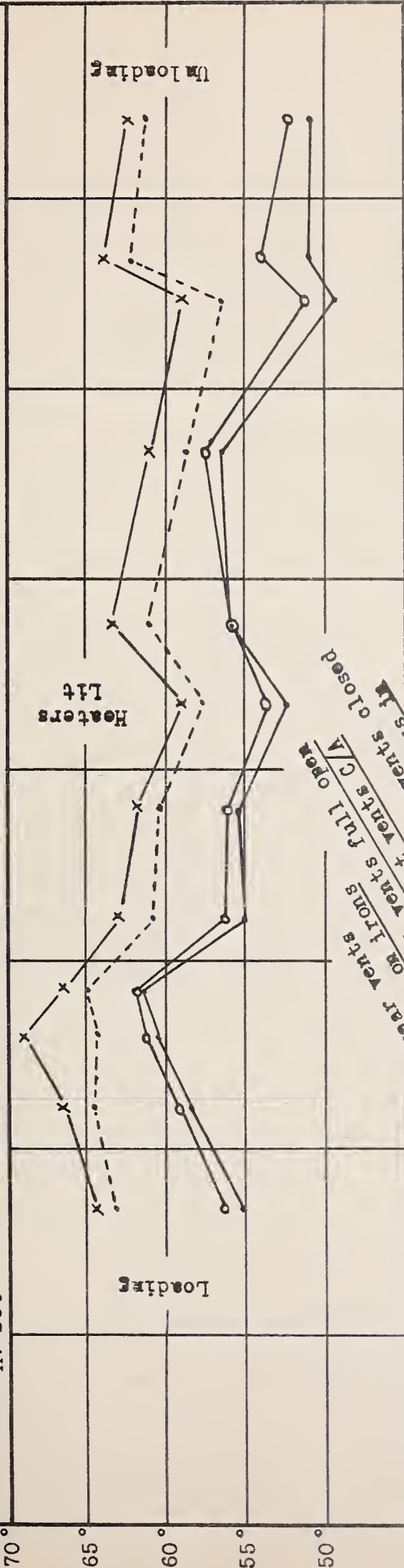
Figure 9

Car H IC 50451  
Alcohol Heaters  
Fans "OFF" - Drains Open

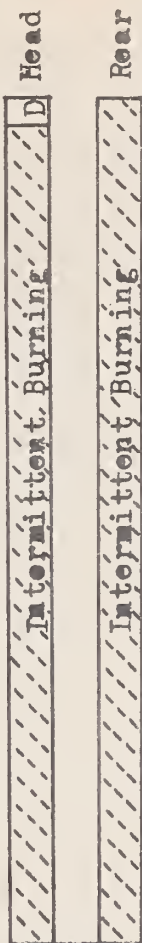
Thermostats set  $57\frac{1}{2}^{\circ}$   
One heater each end

x—x Max  
----- Min  
— Av Top  
o—o Av Bot

$^{\circ}$ F



Vent and  
Heater Record



Fan Operation

None

Outside Air  
Temperature

Max 76°  
Min 62°

Date

Jan 18

Place

New Orleans, La

Jackson, Miss

Memphis, Tenn

Fulton, Ky

Bluford, Ill

Chicago

E. Dubuque, Ill

St. Paul, Minn

Fargo, N.D.

Noyes, Minn

Winnipeg, Man

Winnipeg





Figure 10  
Car J BREX 74398  
Underslung Heater  
Fans "ON" - Drains Plugged

Thermostatically Controlled  
Set at 55°

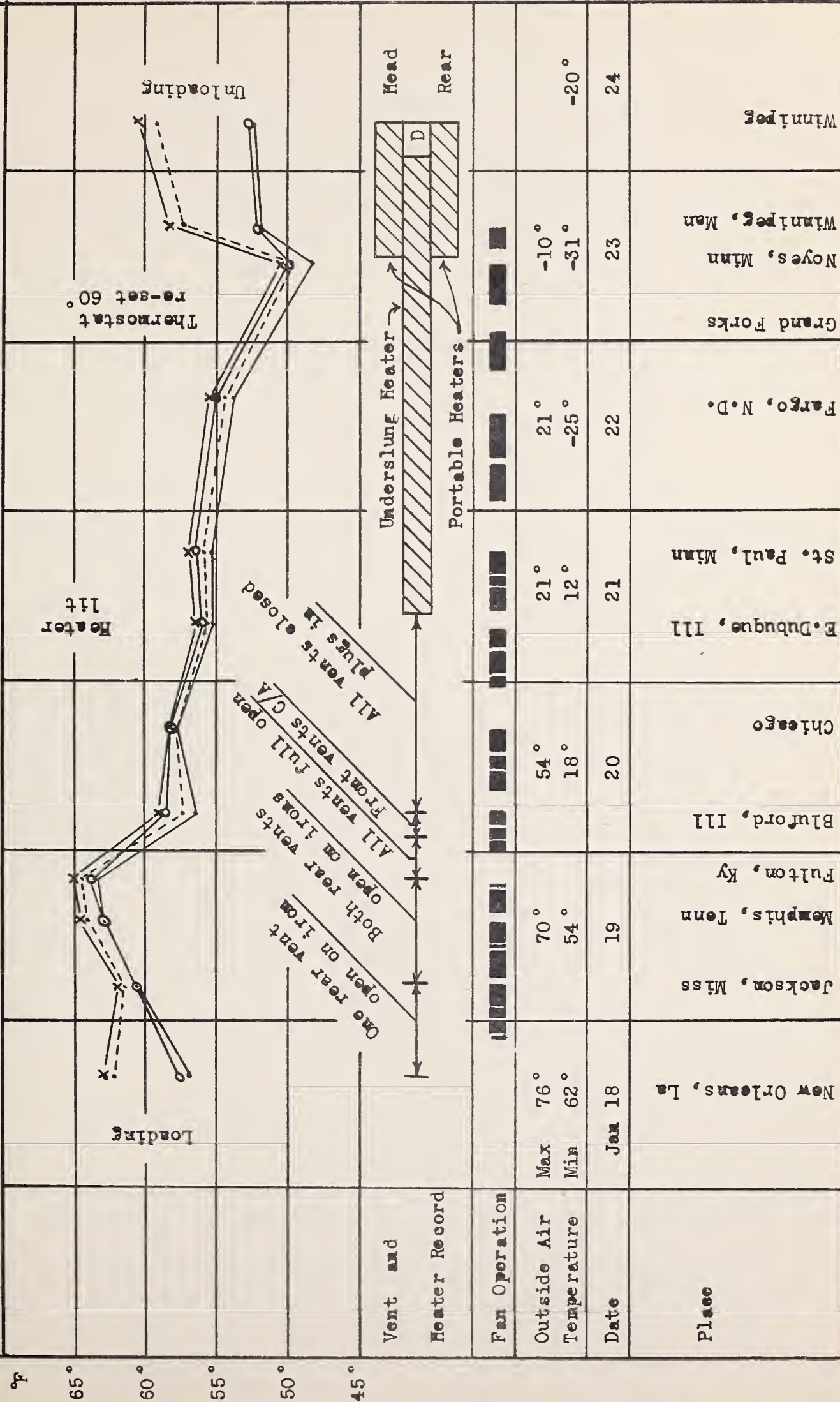
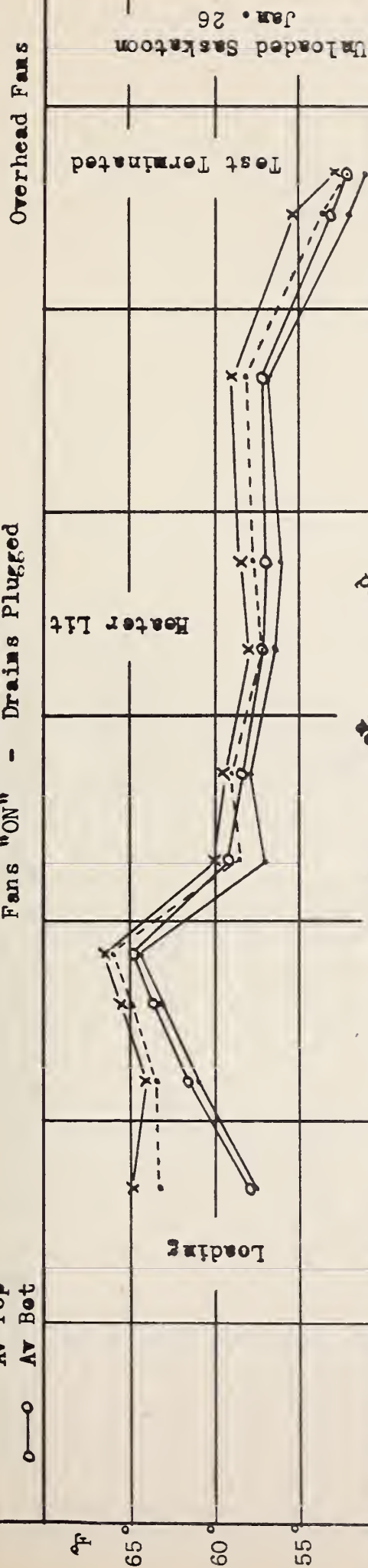






Figure 11  
Car K BREX 74399  
Underslung Heater  
Fans "ON" - Drains Plugged

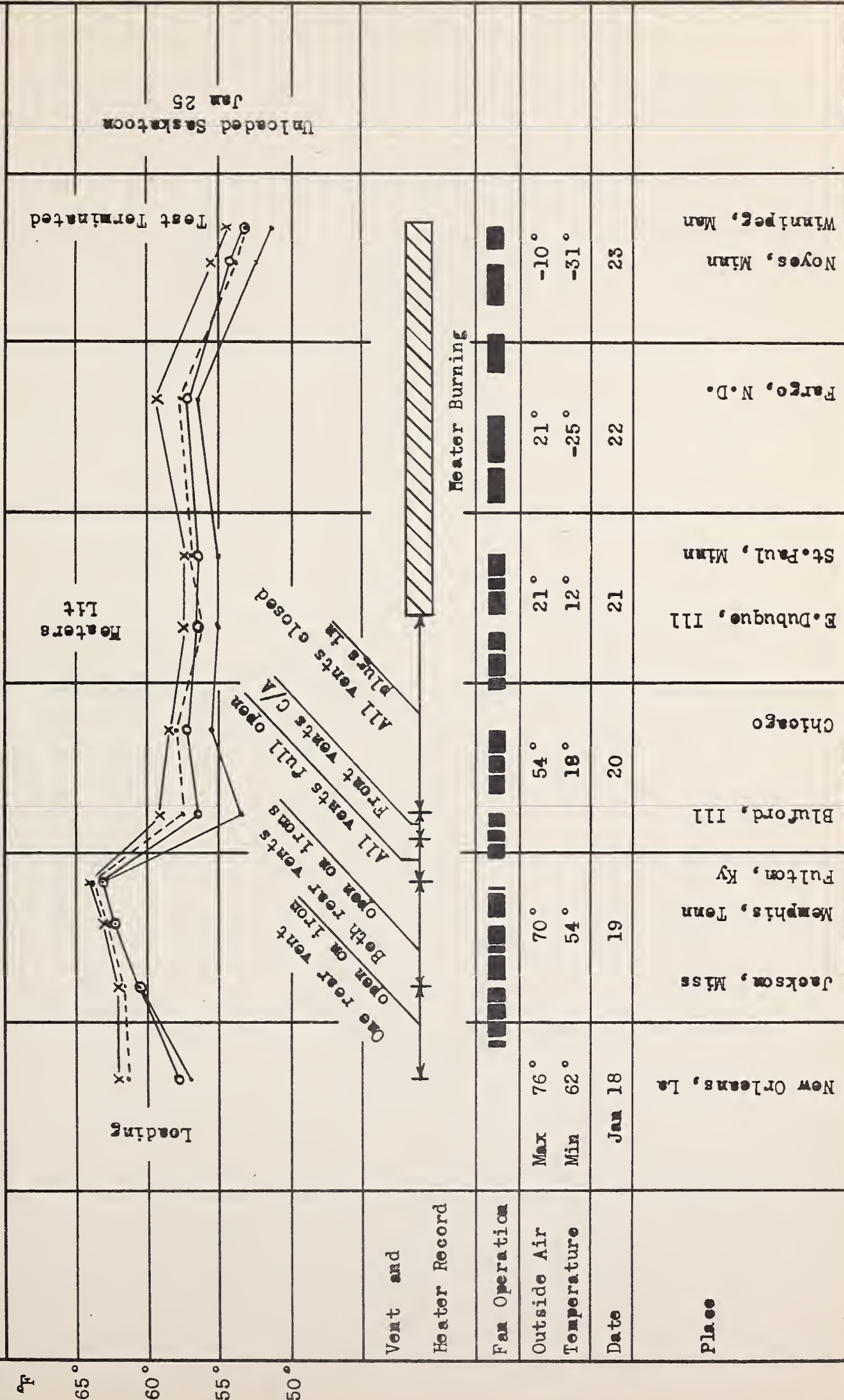


Vent and  
Heater Record

Fan Operation	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23
Outside Air Temperature	Max 76° Min 62°	70° 54°	54° 18°	21° 12°	21° -25°	-10° -31°
Date	Jan 18	Jan 19	Jan 20	Jan 21	Jan 22	Jan 23
Place	New Orleans, La	Jackson, Miss Memphis, Tenn Fulton, Ky	Blufford, Ill Chicago	E. Dubuque, Ill St. Paul, Minn	Fargo, N. D.	Noyes, Minn Winthrop, Mass



Figure 12  
Car AA IC 50086  
Underslung Heater  
Fans "ON" - Drains Plugged



x—x Max  
·-·-· Min  
—○— AV Top  
—○— AV Bot

°F  
65°  
60°  
55°  
50°

Vent and  
Heater Record

Fan Operation

Outside Air  
Temperature

Date

Place

Jan 18

19

20

21

22

23

New Orleans, La

Jackson, Miss

Memphis, Tenn

Fulton, Ky

Bluford, Ill

Chicago

E. Dubuque, Ill

St. Paul, Minn

Fargo, N.D.

Noyes, Minn

Winnipeg, Man

Loading

Heaters  
Lit

Test Terminated

Unloaded Saskatoon  
Jan 25

Heater Burning





Figure 13  
Car BB IC 50225  
Underslung Heater  
Fans "ON" - Drains Open

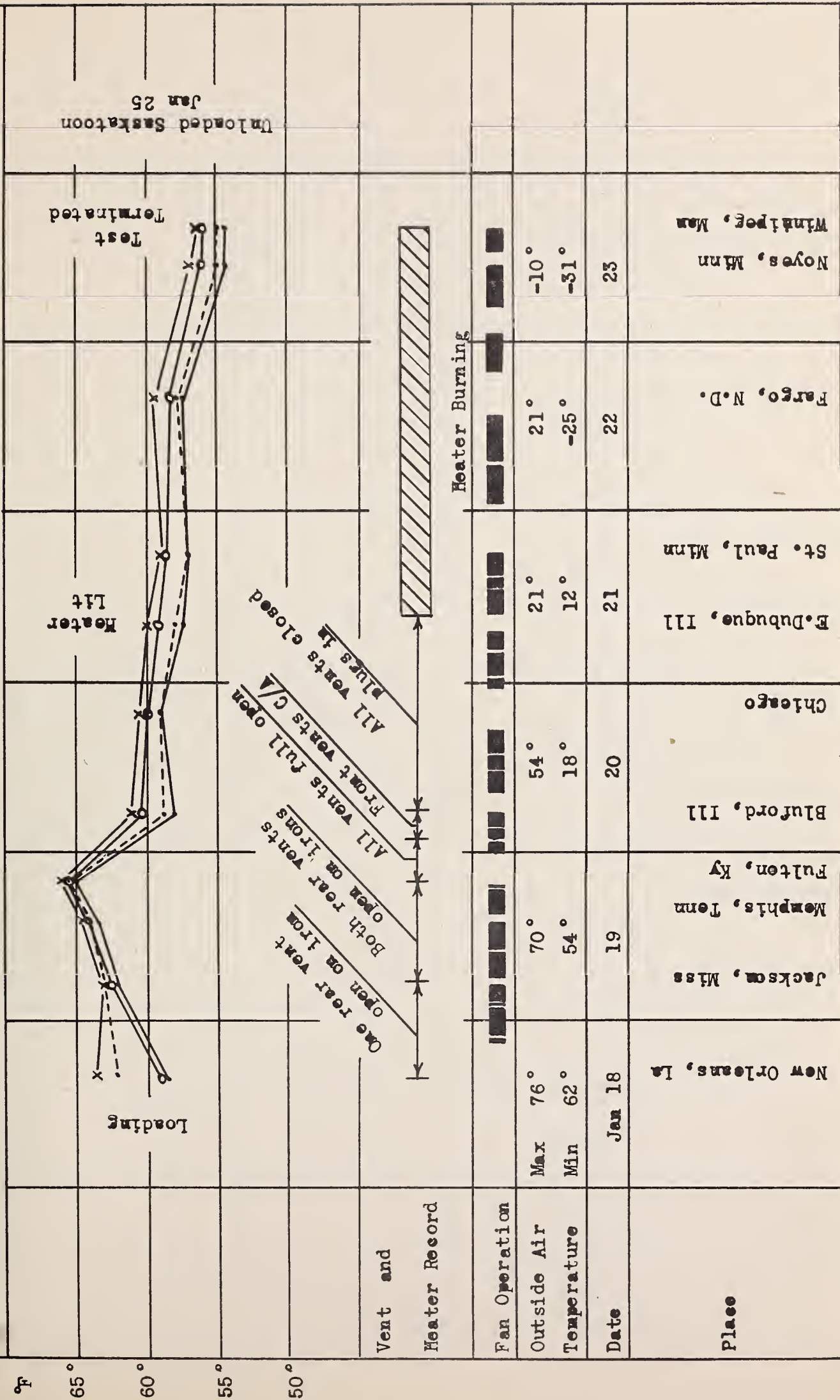




Figure 14  
Car CC IC 50357  
Underslung Heater  
Fans "OFF" - Drains Plugged

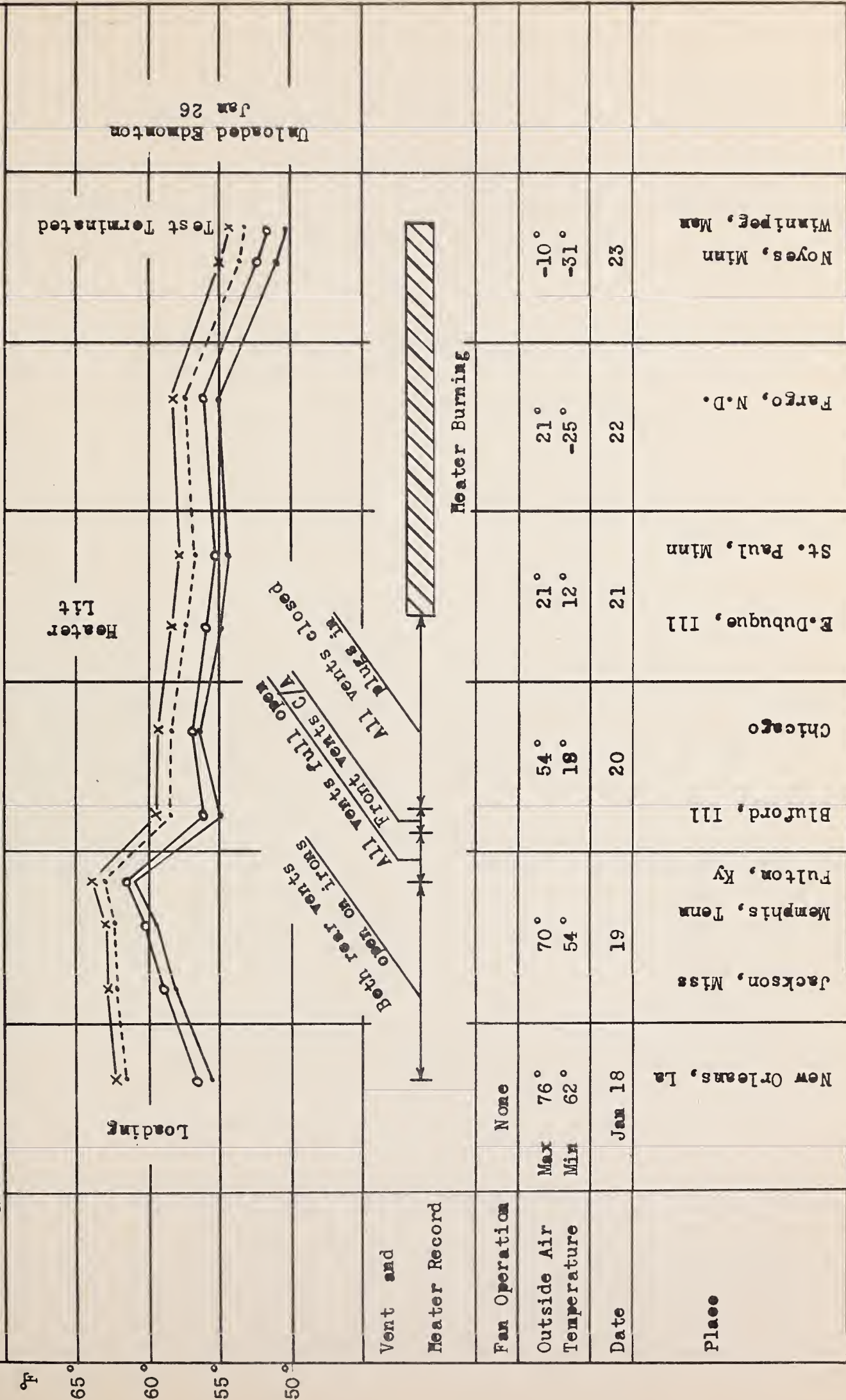






Figure 15  
Car DD IC 50359  
Underslung Heater  
Fans "OFF" - Drains Open

